

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

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EDITORIAL COMMENT



ADMIRAL SIR PHILLIMORE, K.C.B., once Admiral Commanding Aircraft, has once more raised, in the correspondence columns of *The Times*, the plea for abolishing the Royal Air Force and contenting ourselves with a naval air arm and a military flying corps. He has been answered

by Air Commodore C. R. Samson, who, though he thought and thinks that the formation of the Royal Air Force was a mistake, abolishes the ground for his own belief and likewise confounds Sir Richard

A Lost Cause

Phillimore, by asking the pertinent questions:—"If Sir Richard's ideas are followed, what would happen in that important requirement, defence against

aeroplane attack? Whose would be the task of defending England? Would it be the Admiralty or the War Office?" The impossibility of giving a satisfactory answer to those questions is the conclusive argument for maintaining an Air Ministry and a separate Air Force. Air Defence, it is now realised, though it was not realised in 1918, is a separate subject from naval defence and military defence. During the war the defence of London was entrusted successively to the Admiralty, the War Office, and the Air Ministry. It only reached real efficiency under the last-named department. General Ashmore, who was mainly responsible for that efficiency, pleaded in his recent book that the part still played by the War Office, namely, the provision of searchlights and guns, should be made a responsibility of the Air Ministry, so that there should be complete unity of command in air defence. The lights and guns may operate from the ground, not from the air, but they are none the less an integral part of air defence. We are in complete agreement with General Ashmore on that point. No arguments brought forward by the *laudatores temporis acti* have in any way shaken the overwhelming case for entrusting the Air Ministry and the Royal Air Force with the entire charge of the air defence of Great Britain.

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1930

- April 12 .. N.F.S. Air Meeting, Hull.
- April 15 .. Entries close for International Touring Competition.
- April 16 .. T.M.A.C. Debate on Models at Junior Inst. of Engineers.
- April 17 .. Start of Easter Tour to Europe from Heston.
- April 19 .. Leicester Flying Meeting.
- April 21 .. N.F.S. Air Meeting, Hanworth.
- April 26 .. N.F.S. Air Meeting, Leeds.
- April 26 .. 45 Sq. (R.A.F.) Reunion Dinner at "Crown and Cushion," London Wall, E.C.
- May 2 .. A.I.D., T.S.A. Dinner at Hotel Russell.
- May 17 .. Flying Display and Opening of Brooklands Aero Club.
- May 31 .. Official Opening and Air Pageant, Bristol Airport.
- June 7 .. N.F.S. Air Meeting, Reading.
- June 9 .. Northampton Flying Meeting.
- June 14 .. Manston Garden Party.
- June 15 .. N.F.S. Air Meeting, Nottingham.
- June 19 .. Household Brigade Flying Club Meeting at Heston.
- June 21 .. Air Rallye at Haldon Aerodrome, Teignmouth.
- June 26 .. Ipswich Air Pageant.
- June 27 .. R.A.F. Dinner Club Annual Dinner.
- June 28 .. Royal Air Force Display, Hendon.
- July 5 .. King's Cup Race and Hanworth Air Pageant.
- July 13 .. N.F.S. Flying Meeting, Leeds.
- July 19 .. N.F.S. Flying Meeting, Hull.
- July 20 .. International Light 'Plane Tour of Europe, starting from Berlin.
- Aug. 7 .. Norwich Flying Meeting.
- July 26 .. Norwich Flying Meeting.
- July 31 .. Entries close for 1931 Schneider Trophy Contest.
- Sept. 1-6 .. 5th International Air Congress at The Hague.
- Sept. 6-28 .. Aero Exhibition, Stockholm, Sweden.
- Sept. 20 .. Liverpool Air Pageant.
- Sept. 27 .. N.F.S. Air Meeting, Hanworth.
- Nov. 28 ..
- Dec. 14 .. Paris Aero Show.
- Dec. 31 .. Closing date for the Aga Khan's Prize for Indian Flight.

At the same time, it is not hard to see what is working in the minds of those who plead for reaction. Likewise, it is impossible not to sympathise with at least a part of their case. They see that the Army is asked to undertake military defence without full control of its eyes in the air, that the Navy is in a somewhat similar position, and they feel that this is all wrong. In theory, at least, it is most certainly all wrong. Those aircraft which do Army work are as much a part of military defence as the searchlights are a part of air defence. But the reactionaries meet with rebuffs because they do not analyse their own ideas, define their terms, and express their arguments with sufficient clearness. They need, and all who are interested in the controversy need, to grasp the vital difference between unity of command in the air and unity of command in air defence. They overlook air defence altogether, or think that either the War Office or the Admiralty can take it over as a sort of side line. By asking too much, through lack of clear thinking, they stultify a case which has some justice in it.

At present there is no unity of command in any of the three forms of defence. There is no unity in air defence, because the War Office provides the ground units. There is no unity in naval or military defence because the Air Ministry provides the air units. The Fleet Air Arm is subjected to a weird form of dual control which none but Britons could have devised or worked. The War Office seems content to accept on permanent or temporary loan whatever squadrons the Air Ministry can afford to provide, its only concern, apparently, being to avoid payment for its air arm. We have unity of command in the air, but not in any one of the defence services.

In each case the present position is an illogical compromise. But the British race has a strange love for illogical compromises, and a real genius for making them work. We might actually lose more than we should gain if we were too hasty in reducing everything to a logical basis. That may come in time, and we can understand the desire of the naval and military pleaders to expedite its coming. But they make a grand mistake in saying that the only way to bring it about is to abolish the R.A.F. and revert to the status of 1917. Everyone admits that neither Army nor Navy can do its work without a specialised air arm to help it. If the said pleaders would confine their pleas to a demand that each service should have full control over its own air arm they would meet with not a little sympathy. We agree that each service ought to be able to decide the strength and composition of its own air arm, and we also hold that it ought to pay for it. Practically, the Navy does that already, but the Army does not. For the moment, at any rate, it is of less importance whether the personnel of that arm is supplied by the Air Ministry or not. Logically, of course, each service should provide its own personnel, but the more important point is that each should have complete control of the strength, operation, and cost of its own air arm.

The only objection which has been brought against such an arrangement is a horrified exclamation, "What? Three air forces!" To this the very obvious answer is, "No, certainly not: there will be one Royal Air Force and two air arms." An Air Force and an air arm are two very different things, and no progress will be made so long as people continue to confuse the two.

A re-arrangement on the basis of unity of command in each of the three spheres of defence would certainly benefit the cause of flying. It would lead to the use of more aircraft, and so would help the hard-pressed and all-important aircraft industry. It would relieve the Air Estimates of sums which certainly ought to be borne on the Navy and Army Estimates. It would clarify the whole position, and put an end finally to these recurrent attacks on the Air Ministry. It should also stir the two older services to take more interest in their own air arms, and to study the possibilities of expanding them and saving on other directions. And, finally, it would leave it clear and beyond dispute that the Air Ministry and the Royal Air Force are absolute national necessities.

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A little more than a year ago (January 10, 1929) we referred in these columns to the excellent work carried out by the French "Avion-Aviso" service of the *Compagnie Générale Aéropostale* between France and South America. Some extremely interesting information concerning this service was given by Monsieur Grimault in his lecture to the Royal Aeronautical Society on April 3. The service is one of very considerable difficulty, and our French friends are entitled to our unstinted admiration for the courage and determination shown in establishing and maintaining such a service in face of great obstacles.

Figures given by Monsieur Grimault indicated that the weight of mails carried on the service between France and South America was more than trebled in 1929, as compared with 1928, the respective figures being 8,943 kg. and 2,732 kg., respectively. Similarly, the weight of goods carried rose from 17,470 kg. to 28,602 kg. It may be argued that these quantities are relatively small in themselves, bearing in mind the cost of operating such a service. The answer to that is, we think, that it must necessarily take time to establish confidence in the reliability of the service, and that until such confidence has been established, it is not to be expected that full use will be made of the service.

The French are taking a long view, and although at the present moment it is doubtful whether the service pays, even with the substantial subsidy (more than 10½ million francs), there is no doubt that in time it *will* pay. This service is an excellent example of the impossibility of assessing, from a balance-sheet of expenditure and receipts, the value of the service given. It may be many years before the balance-sheet shows a profit, but the real test of the usefulness or otherwise of such a service is not the balance-sheet, but the benefit which France and South America derive from the saving in time which the aeropostal service achieves. This is impressive to say the least of it. Normally, the mail takes 25 days to reach Santiago. The "Avion-Aviso" service has reduced that to 8½ days. For Montevideo and Buenos Aires, the figures are 18 days and 7½ days, respectively. The reliability figures quoted by Monsieur Grimault are very good indeed, considering the difficulties of the route.

It has not yet been possible to carry out the oversea passage with aircraft on a commercial basis, but every effort is being made to achieve this. Buenos Aires will then be within five days of Paris! Great Britain has the finest flying-boats in the world, but she has made no effort to share with France a route of such infinite possibilities.

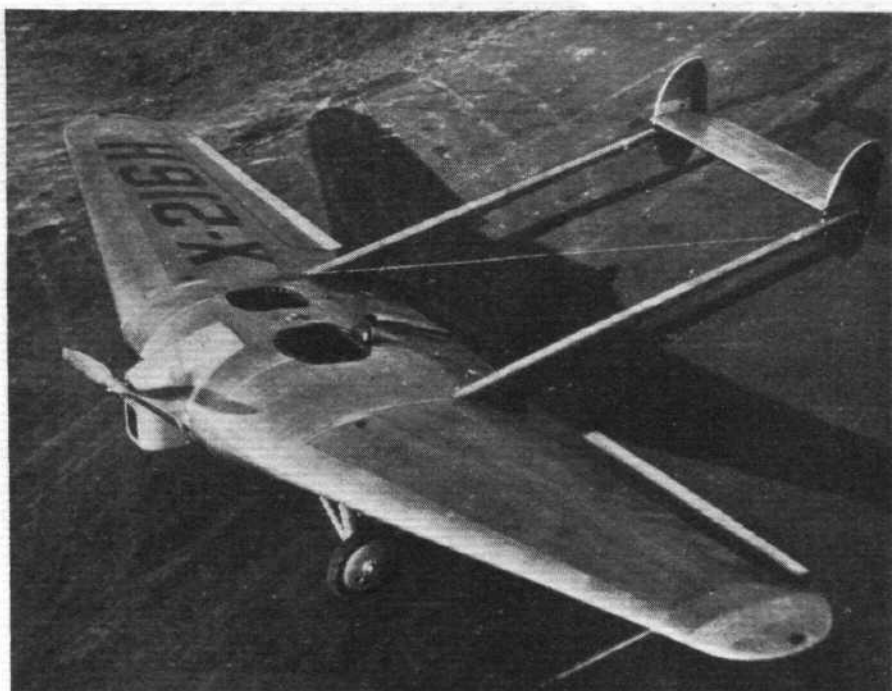
AN "ALL-WING" MONOPLANE

American
Designer's
Experiment

BUILT as a "flying model" for collecting test data for the design of a larger machine, the little two-seater monoplane illustrated herewith was designed by Mr. Northrop, of the Northrop Aircraft Corporation, of Burbank, California, U.S.A. and has already undergone its preliminary flying tests, although further tests are still being made.

The "all-wing" aeroplane is not, of course, new. Professor Junkers, as long ago as 1910, took out a patent on a machine of the "nur flügel" type, and the subject has engaged the attention and taxed the ingenuity of designers ever since. It is a well-known fact that aerofoils, tested by themselves, may have maximum L/D ratios as high as 25:1. The most efficient aeroplane ever produced falls very far short of this, due to the resistance of all such items as fuselage undercarriage and tail surfaces. Obviously if all these items could be suppressed, the efficiency of the aircraft would be that of the wing itself, an improvement in efficiency which could either be used for getting greater speed out of a machine with the same power, or for more economical power expenditure for a given weight, or for any combination of the two desiderata. It is, however, an unfortunate fact that the normal aeroplane wing, as built in the usual sizes of machine, gives no room for passengers or freight, and it is also somewhat unfortunate that aerofoils which are naturally stable do not exhibit high values of the ratio L/D . Consequently we add fuselages to our wings to contain the useful load, and tail surfaces to stabilise the wing.

The new Junkers G.38 goes some way towards the "all-wing" machine, but it still has both a fuselage and a tail. Mr. Northrop has not chosen to wait until he can build a very large machine in which, through sheer size, the wing is deep enough to contain the crew. He has followed somewhat the example set in the Remington-Burnelli machine by having the centre-section of the wing very thick—deep enough, in fact, to enclose the crew, and has then attached to the sides of this thick centre-section a wing of more or less orthodox design. The Northrop machine, however, departs from the Burnelli in that the monoplane wings are faired into the centre-section, and the latter does not extend back to the tail but stops short at the wing trailing edge, the tail being carried on two slender tail booms.

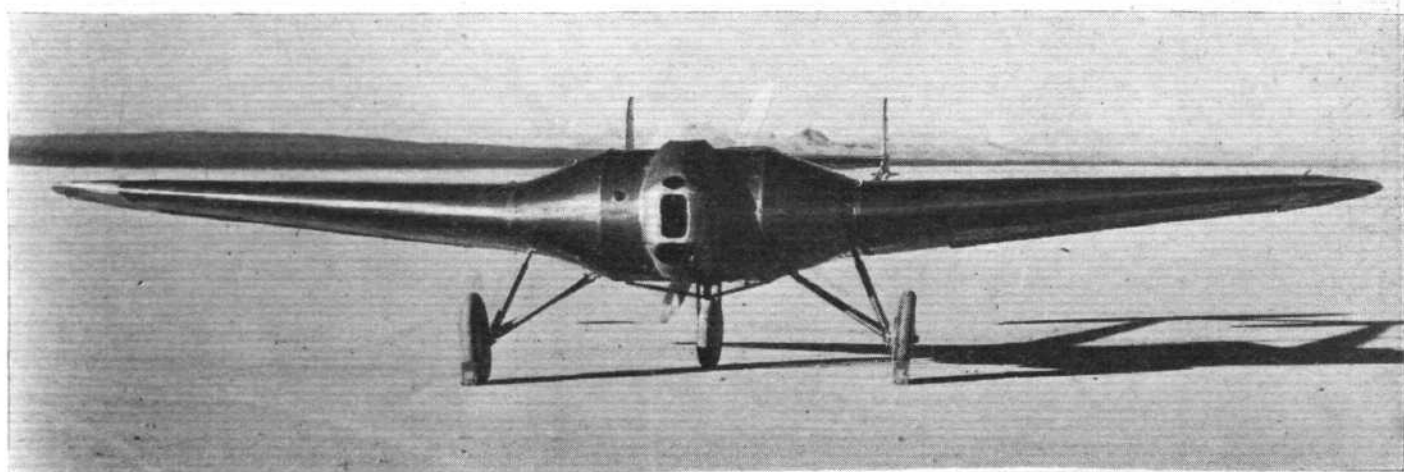


View from above of the Northrop Monoplane. This photograph shows the machine fitted with tractor airscrew.

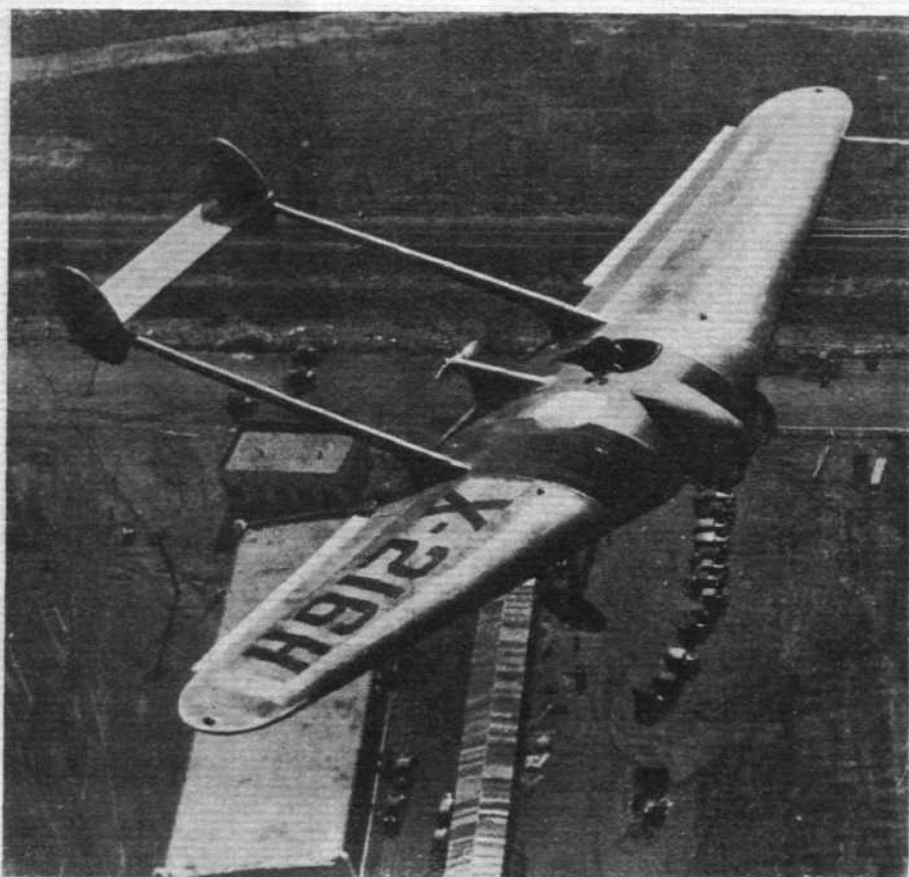
The Northrop monoplane here illustrated is a "flying model" in two ways: For collecting data that can later be applied to a larger machine, and for testing in actual flight a new form of construction, in which the smooth skin of the wing carries most of the wing loads. As far as can be gathered the small machine has proved the success of both the aerodynamic and the structural features which it was desired to test. Concerning the latter, it may be stated that recently a monoplane of orthodox aerodynamic design was completed by the company, employing the stressed-skin type of wing construction. That machine is, apparently, satisfactory from a structural point of view.

As regards the aerodynamic design of the small two-seater, we regret that no very detailed data are available, but the Northrop Corporation states that the machine has "a top speed of approximately 25 per cent. better than any other design of like power and capacity." This would appear to indicate that the drag of the Northrop "all-wing" monoplane is about 65 per cent. of the drag of an orthodox machine of the same wing loading and power loading. This is an improvement which is not to be sneered at. Unfortunately it is not stated whether this improved speed figure relates to the machine with undercarriage retracted or exposed. It is assumed to refer to the former, as there does not appear to be cause to believe that the drag with undercarriage exposed could be so much lower than the drag of an orthodox machine.

Apart from the unusual lay-out of the wing and centre-section, the machine is mainly remarkable for the three-



THE NORTHROP "ALL-WING" MONOPLANE: This front view of the "pusher" version illustrates very clearly the tapering of the thick centre-section into the wings proper, and also shows the three-wheeled undercarriage.



The Northrop "All-Wing" monoplane (pusher version) in flight. One cockpit covered in.

wheeled undercarriage, and for the unusual engine and propeller arrangement. The engine, an inverted "Cirrus," is mounted in the leading edge, and an air tunnel extends from the scoop in the cowl through the wing to an exit in the under surface, near the trailing edge. The cooling is reported to be excellent. Arrangements have been made for testing the machine both as a pusher and as a tractor. In either case the engine is in the nose, but the "pusher" airscrew is driven via a long shaft passing between the two cockpits.

The three-wheel undercarriage is placed with two wheels in front and one centrally behind, the weight carried by each being approximately equal. One is somewhat puzzled as to how the machine is got off with this arrangement. A retractable undercarriage was tested in flight, but afterwards a permanent chassis was used for further performance tests.

It is stated that although the tail booms are slender and somewhat flexible, no trouble with tail flutter has been encountered.

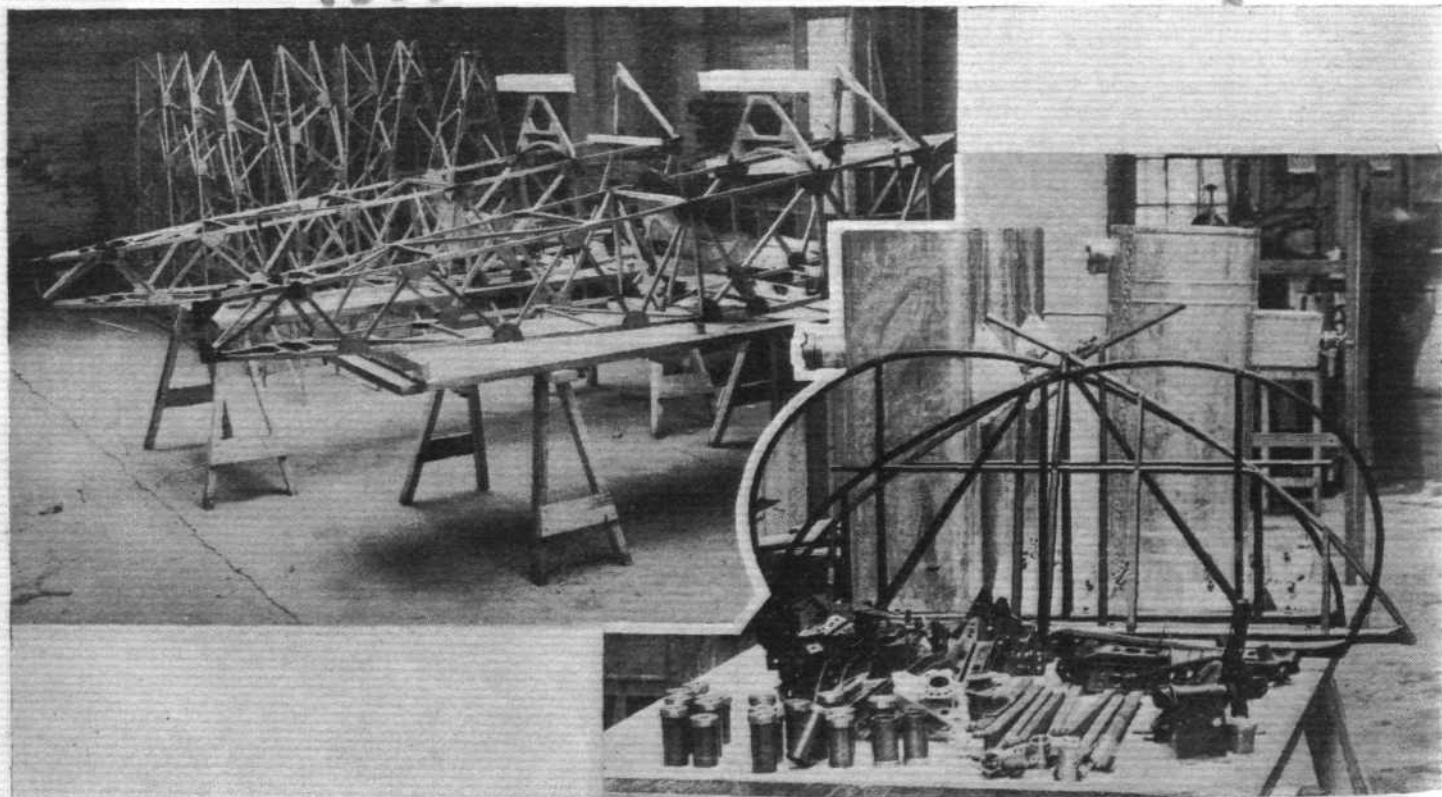
The view from the cockpits cannot be described as good, but as the machine is not intended as a light 'plane, but as a flying model of a larger machine, in which the pilot would be differently placed, this criticism is of no real importance.

The Northrop monoplane has a wing span of 30 ft. 6 in. and a length of 20 ft. The wing area is 184 sq. ft., and the maximum wing thickness 34 in. The gross weight is 1,600 lb. No performance figures are available.

German Machine Crashes at Limpsfield

On Monday, April 7, about 4.15 a.m., a metal Junkers aeroplane of Luft Hansa, bound from Croydon to Berlin, crashed on a hill between Limpsfield and Westerham in Kent. The pilot, Karl Wessel, and the mechanic, Gustav Ferdinand Konnert, were thrown clear of the machine and killed by the impact with the ground. There were no other

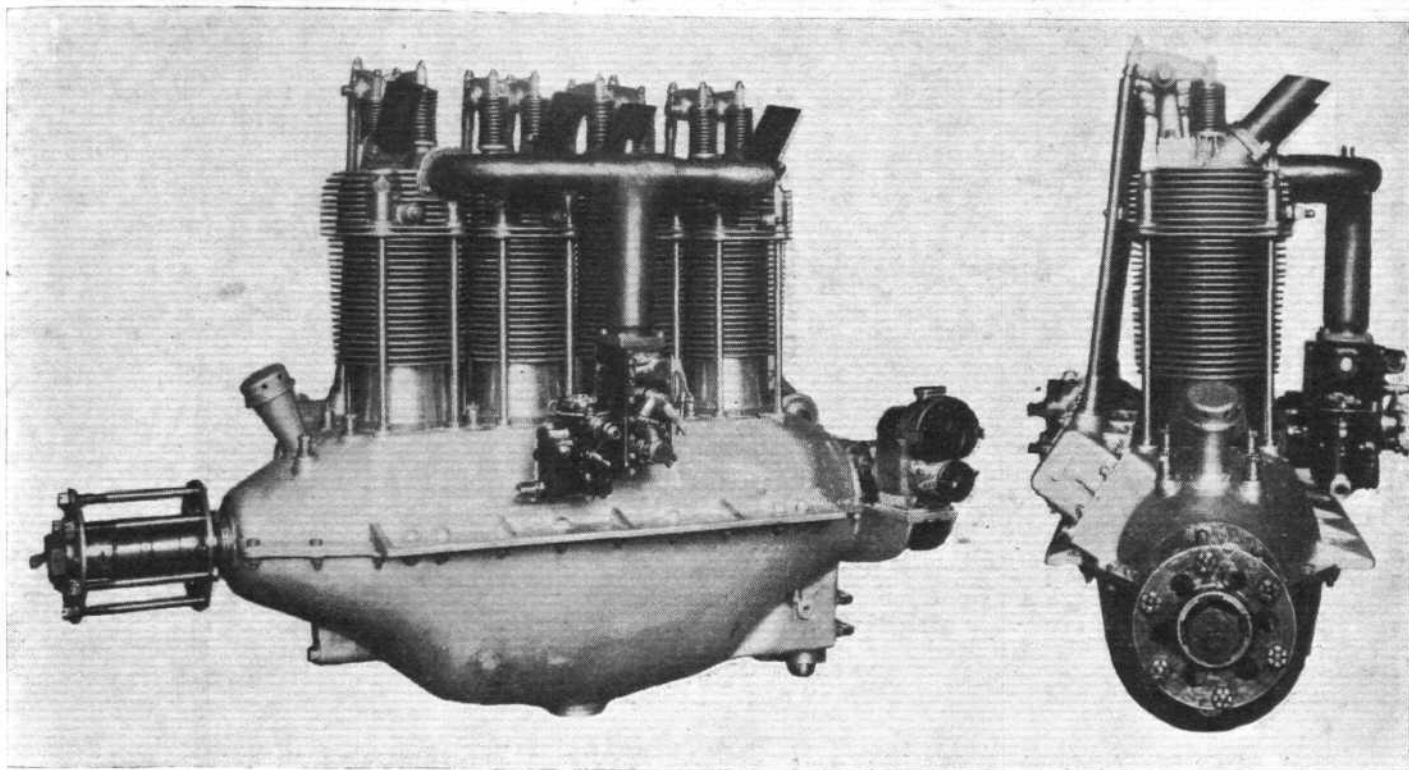
persons on the machine. After the crash the petrol from the broken tanks caught fire and consumed most of the machine. Both bodies were dragged clear by neighbouring farmers before the fire reached them, and one bag of parcels was also saved. It seems that the pilot had lost his way in the fog, could not see the beacon lights, and did not know how near he was to the hill tops.



THE COMPER SWIFT: The first production batch of Swifts going through the Hooton works of the Comper Aircraft Co. (FLIGHT Photo.)

THE MICHEL A.M.14 MARK II

A French 4-Cylinder Aero Engine



Side and front views of the Michel A.M.14, Mark II, engine.

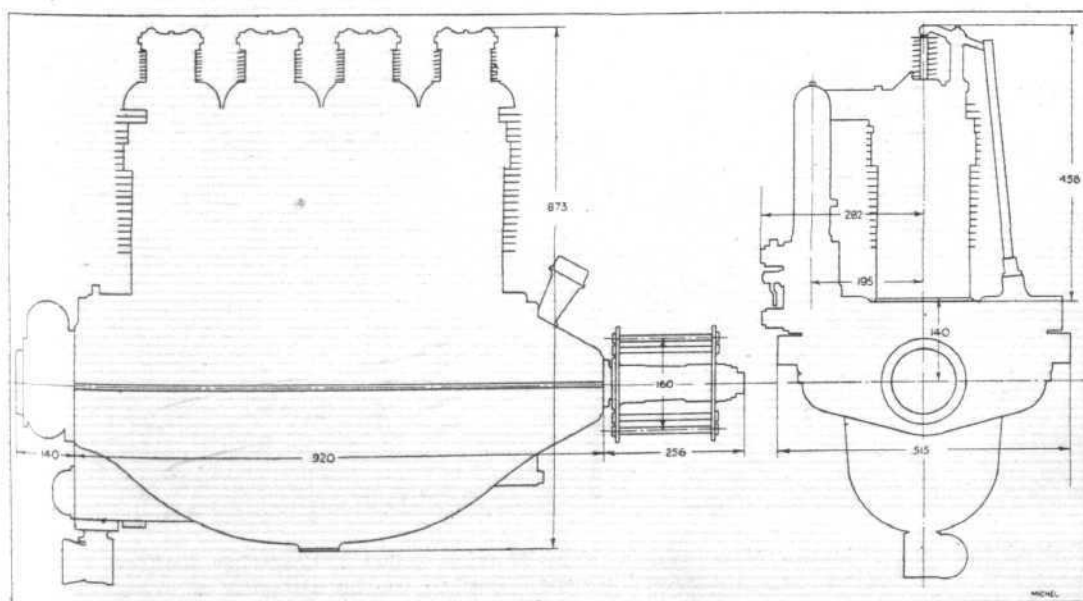
ALTHOUGH exhibited as long ago as the Berlin Aero Show in 1928, the light 'plane engine designed and built by Aviation Michel of Strasbourg has not become generally known among owners of light aeroplanes, at any rate in this country. The engine has recently passed the type tests of the French Air Ministry, and as there is a possibility that a London representative will be appointed shortly, we have thought that a brief description of the engine may be of interest to readers of FLIGHT.

Known by the series number A.M. 14 Mark II, the Michel engine is a four-cylinder, in-line, air-cooled engine of fairly orthodox layout. In its details, however, several ingenious features are to be found, and it may be said at once that simplicity and reliability are the main points aimed at by the designers. From the aircraft designer's point of view one of the attractions of the Michel engine is that its frontal area is small, the engine itself being of small width, and such accessories as would have tended to increase the overall

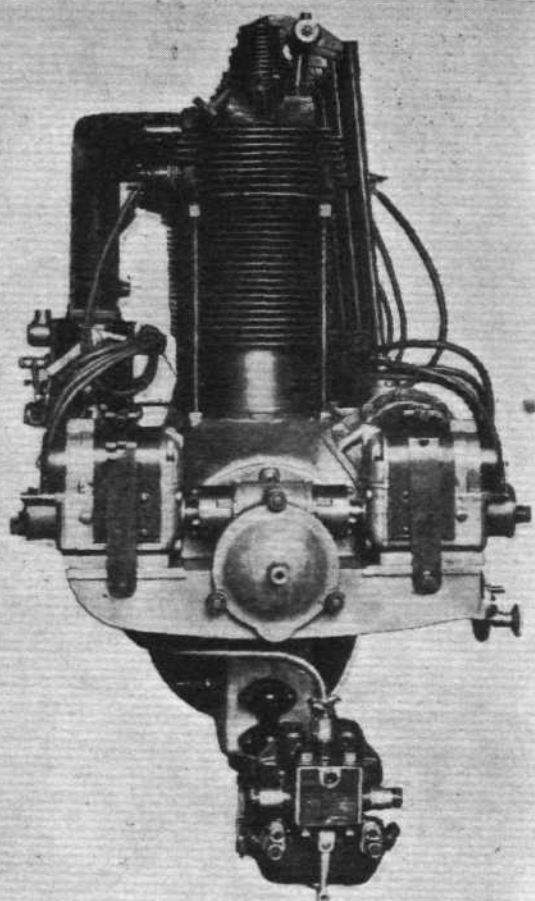
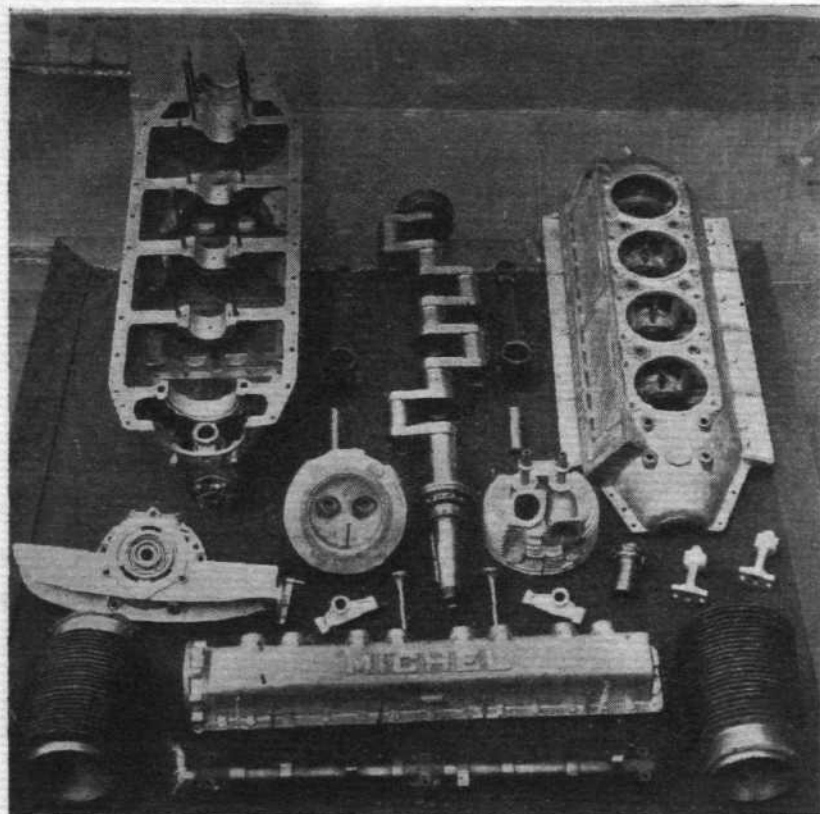
width of the engine having been grouped at the back, where width is of less consequence.

The A.M. 14 Mark II is not a small engine, however, having a capacity of nearly $7\frac{1}{2}$ litres, and as its normal power output is 100 b.h.p., the horse-power per litre is not high, *i.e.*, 13.5. On the other hand, the weight is 312 lb., giving a weight per litre of 42.2 lb., which cannot be regarded as a high figure for this type of engine, especially as it includes a Saintin compressed-air starter. And the Michel is of the slow-running type, the speed corresponding to normal power being no more than 1,700 r.p.m., a speed which should give good propeller efficiency in a machine cruising at 85 to 90 m.p.h. The compression ratio is about the normal, *i.e.*, 5.1 : 1.

An aluminium crankcase split along its lateral centre line is employed, webbed internally to carry the crankshaft main bearings. The two halves of the crankcase are secured together by studs and bolts, and the upper half has out-



Outline installation diagram of Michel A.M.14 engine.



THE MICHEL A.M. 14 ENGINE: Left, some of the detail components, such as crankcase, crankshaft, camshaft, camshaft cover, etc., and on the right a rear view of the engine.

wardly-extending flanges to act as supports for mounting the engine. The crankshaft is of chrome nickel steel, and runs in five white-metal-lined bearings. The camshaft is carried in a separate casing protruding from the starboard side of the crankcase, and carries on its top the guides for the push rods. The cylinders have steel barrels, with Silumin aluminium alloy heads. The manner of making a gastight joint between cylinder head and barrel is by a metal-to-metal joint, the faces of barrel and head having concentric V-section grooves turned on them.

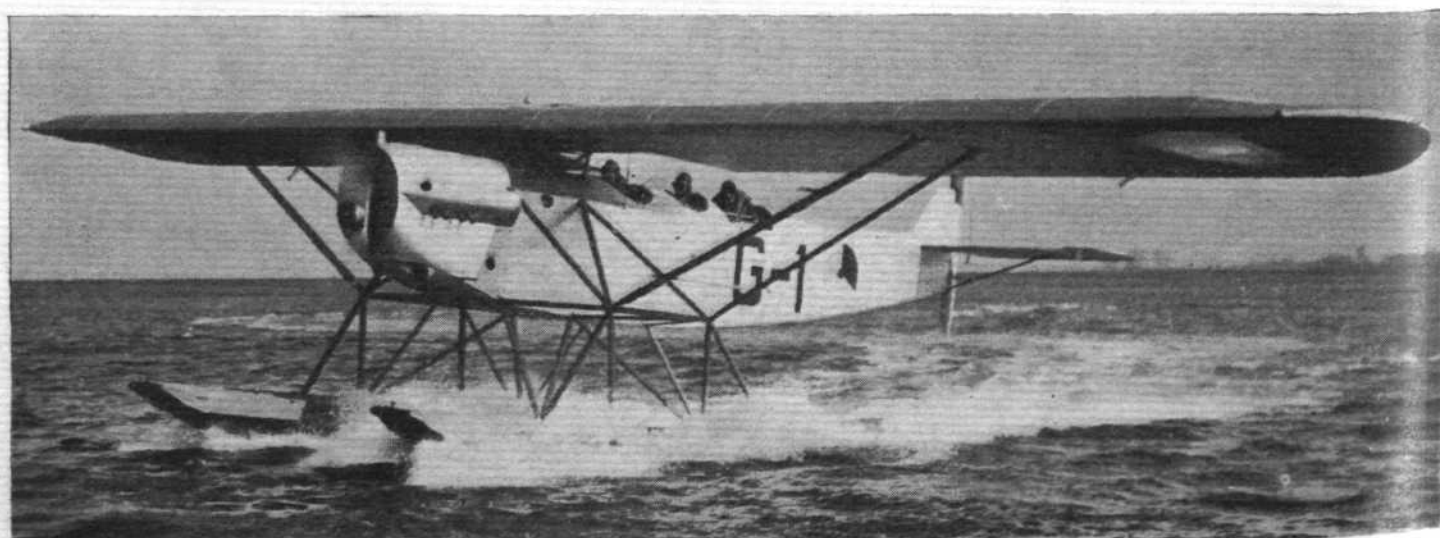
There are two overhead valves per cylinder, and the rocker spindles are provided with concentric bushes so arranged as to keep the valve clearance constant when the cylinder expands under heat. The exhaust valves are on the right, and the oil-heated induction manifold on the left sides.

The connecting rods are of chrome nickel steel, with split big ends lined with white-metal. The aluminium pistons have four rings each, three compression rings above

the gudgeon pin and one scraper ring below it. Lubrication is on the dry sump principle, a large centrifugal pump being mounted in the base of the crankcase, at the back. Two magnetos, transversely mounted on a platform at the back of the engine, provide dual ignition to two plugs per cylinder, one on each side.

The main data of the Michel A.M. 14 Mark II are as follows: No. of cylinders, 4; bore, 125 mm.; stroke, 150 mm.; cubic capacity, 7,400 c.c.; compression ratio, 5.1:1; normal speed, 1,700 r.p.m.; normal power, 100 b.h.p.; maximum speed, 1,850 r.p.m.; maximum power, 110 b.h.p.; petrol consumption, 225 grammes (0.495 lb.) per h.p. per hour; oil consumption, 25 grammes (0.055 lb.) per h.p. per hour; weight, including propeller hub and compressed air-starter, 142 kg. (312 lb.).

Arrangements have not yet been completed for a London agency, but it is likely that the A.M. 14 Mark II will be sold in England for approximately £280.



THE LATEST FOKKER SEAPLANE: This machine, type C.VIII-W with 450-h.p. Lorraine Engine, has been supplied to the Dutch Navy and is intended for sea reconnaissance. Owing to the absence of cross members in the float suspension, the machine can also be used for training crews in dropping torpedoes. The strutting of the float chassis would almost pass the ancient British "Thrust Test."

PRIVATE FLYING AND CLUB NEWS



THE B.B.O.A.C. CLUB HOUSE : The standard N.F.S. provincial club house. (FLIGHT Photos.)

THE READING PAGEANT

THE READING PAGEANT, on Saturday, April 5, was a success, in spite of the rain and bitter cold wind, for the weather could hardly have been more unkind at the start. The visibility was very bad, and flying down to Reading one could well understand the point of view of a well-known Australian who asked what was the idea of trying to run internal airlines in a country like this. However, in spite of this, 30 machines turned up, and some four thousand spectators lined the ropes.

The official opening of the club-house, which has been built on the standard plan of N.F.S. provincial clubs, was performed by Col. Sir Leslie Wilson, and he afterwards declared the Berks, Bucks and Oxon Aero Club open, and fired a Veré light to signify this fact. Sir Sefton Brancker was among those present, and of course the directors of N.F.S. were there in force.

The programme had to be somewhat rearranged, as the R.A.F. help which had been promised, in the shape of a display by No. 600 Auxiliary Squadron, who were to have flown their new Westland Wapitis, was at the last moment cancelled, presumably on account of the weather, which was not good for the trip from Hendon, so the Pageant opened with a fly-past of most of the machines present on the aerodrome. These fly-pasts are always rather amusing, and this one was particularly so. The machines taking part ranged from the D.H. 61 Leone neé Geraldine, down through Moths, Avians, Desoutters, Auto-Giros, Martlets, etc., to a D.H.53 with a Blackburn Tomtit engine. Several circuits were made by all machines during which three of the club Moths kept an exceedingly good formation, a very creditable performance for club pilots. After one or two dives over the aerodrome, the machines, which had been led off by Capt. Schofield in a Moth, landed individually, though the local formation continued to show its well-trainedness by landing in formation.

The race for the Berks, Bucks, and Oxon Cup was a 33-mile one, comprising five laps of a course. This was limited to owners of private aircraft, and eliminating heats for both this and the subsequent race, had been run off during the forenoon, so that after the fly-past we simply had the finals. In this race there were four finalists, Miss Spooner flying her Gipsy-Moth LK, F/O. M. Bainbridge in Gipsy-Moth SG, A. Jackaman in his Coupé Gipsy-Moth DX—its pristine finish still unsoiled—and F/O H. Leech in IIa Martlet; this was the order they took off in, and they held this order to the finish, with a slight opening of their ranks from lap to lap. On the first lap, one of the competitors brought an audible gasp of horror to all spectators; he deliberately attempted to turn inside another competitor on the first turn, and on

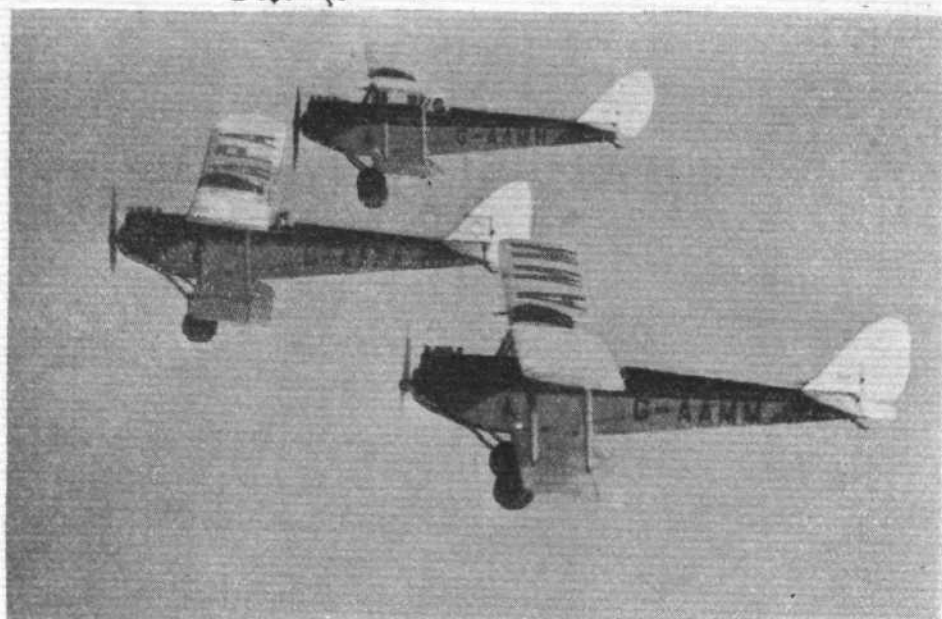


THE OPENING SHOT : Left to right, Col. I. Edwards, Sir Leslie Wilson, with Sir Sefton Brancker behind him, Capt. F. E. Guest, Mr. G. Boyes.

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THE WORMSEYE VIEW : Capt. Schofield inverts !



FORMATION : The N.F.S Circus at work.
(FLIGHT Photos.)

finding that it was going to be too close a thing he let his nose drop and consequently dived among the machines parked on the corner: he missed them by an almost unmeasurable amount, and got away with it. No doubt it was the only thing he could have done in order to get out of such a position, but the fact remains that he had no right to get into such a position and thereby endanger the other competitors in the way he did. However skilled the pilot, and he must have been skilled in order to have emerged safely from such a turn, there is not the slightest excuse for cutting things too fine in these races; it may mean losing the race, by not doing so, but after all, that affects the individual alone, whereas a crash, with the possible repetition of the ghastly result which occurred at Bournemouth Whitsun meeting, 1927, would have the direst effect on these meetings, and on the whole business of club flying and private ownership. However, this episode, dangerous as it was, hardly calls for an outburst over the control of the meeting as a whole. Certain critics have averred that the organisation, though good of its kind, was lacking in thoroughness, and that very much stricter control ought to be exercised. We certainly did not see constant occurrences which could be taken as evidence that there was any lack of control, although the whole meeting was admittedly run on cheery and, to a certain extent, happy-go-lucky lines, and to unreservedly suggest that such meetings should be run by officials from the Air Ministry seems a much too drastic step to take. Meetings have been run perfectly safely during the past few years without going to that official body for such control, and we think that with due care, there is no reason on earth why any ordinary club committee should not be able to formulate rules and to enforce those rules which should safeguard pilots, spectators, and machines, and at the same time retain that spirit of cheeriness which has made these meetings so popular.

Reverting to the first race; the order of starting was maintained to the end, and Miss Spooner finished first, with a speed 106.5 m.p.h., and F/O. M. Bainbridge second, at 105.5 m.p.h.

The second race was in some ways rather a foregone conclusion, because it was a scratch race for B.B.O.A.C. members with F/O. Leech in VP, a Hermes-Avian belonging to Mr. Player, a member of a family not unknown in connection with cigarettes; Mr. I. S. Tanner, in SG, the same Gipsy-Moth as was in the first race; and Mr. M. Scott in a Cirrus-Moth XG.

The Hermes-Avian finished first at 113.5 m.p.h., the course being the same as for the other race.

After the two races, there followed a series of aerobatic displays by N.F.S. pilots. First, Flt.-Lt. I. MacKenzie gave a demonstration in a Moth. He executed all the usual manoeuvres cleanly and well, and unfortunately for us, did nothing wrong or bad which would have given us something to write about. Aerobatic displays have now become almost stereotyped, and there is little left that the pilot can do, or that we can say, except to eulogise their performances when they deserve it, and Flt.-Lt. MacKenzie certainly did.

Flt.-Lt. J. Wilson exhibited all the properties of a Moth when fitted with slots in a most definite and skilled manner, and Flt.-Lt. H. Schofield then gave one of his very polished displays. His slow rolls were perfect and the envy of many pilots who were looking on, and at least one well-known pilot said that it was the most perfectly finished display that he had ever seen.

An Austin Baby which was on the programme to be bombed in the approved style must have swollen with pride at the

idea, for it appeared as a large saloon with a mixed crew on board, but, notwithstanding this metamorphosis, we did not observe any direct hits to be gained.

Flt.-Lt. Schofield then took up his "circus" of Flt.-Lts. Wilson and MacKenzie all on Moths and gave a beautiful display in formation. This circus will be remembered at certain N.F.S. meetings last year and the intervening time has evidently been spent in practising, for the result is a great improvement. It is no easy matter to loop a Moth in formation, but these three performed this and many other manoeuvres as though it were the easiest thing in the world.

After an interval, during which the Autogiro gyrated—



8515
THE WINNERS : Miss Spooner on the right and F/O. Leech on the left. (FLIGHT Photos.)

surely flew is not the right word—around the aerodrome and landed almost vertically, Flt.-Lts. Wilson and MacKenzie proceeded to show how their machines should be spun, looped, rolled, and side-slipped until the Verey pistol of Capt. Pennington recalled them to a normal state of equilibrium.

Flt.-Lt. Styran then emulated the amateur who was taking a forbidden flight before having received sufficient instructions and did a series of hair-raising flat turns, ground hops, stalled turns and many other things, which everyone is taught not to do, but which appear perfectly safe when done by such a pilot as he. No doubt this was a very acceptable interlude for him since he had been working hard, taking up some 400 passengers in Leone all the afternoon.

The final item was an efficiency competition for club members. They were required to take off and fly three figure of eights at about 500 ft. and then shut off their engines and land as near to the circle on the aerodrome as possible. Those taking part were all *ab-initio* pilots, trained by the club since it has been run by N.F.S. There were six in the competition, Capts. Holmes and Stoppford, Messrs. Murray Brown, Scott and Field Richards and Maj. Osmaston.

Miss Spooner had consented to act as judge for the competition and gave the first prize to Mr. Murray Brown, the second to Mr. Scott and the third to Mr. Field Richards.



THE LIGHTER SIDE: The little D.H. 53 used for a comic turn. (FLIGHT Photo.) 8510

Among the visiting aircraft were two new ones. First there was the first of the all-metal Junkers Juniors, with an Armstrong-Siddeley Genet engine, to be seen over here with British registration numbers. This machine is the first of those which will be imported by Trost Bros., who are handling the Junkers machines over here. This new model has been very much cleaned up since the Show, and the cockpits are now free from the mass of pipes, which made them rather reminiscent of a German submarine. We were privileged to fly the machine for a little while and found it delightful; the elevator is just sufficiently sensitive to be pleasant and the lateral control, though not so sensitive as the elevator is at the same time adequate; the rudder is in



THE FLYING TEST: W. B. Rich are running their Moth on their mineral oil to give practical proof of its ability to do the job properly. (FLIGHT Photo.)

keeping with all Continental machines, in that it requires a great deal more movement than our own light aircraft, but it does give sufficient control for all normal use. This rudder question is a point upon which opinions are divided, and the makers maintain that while their rudder is large enough to control the machine comfortably, it is not large enough to get the pilot into trouble easily. There is, undoubtedly, a lot in this point of view, but we cannot help thinking that there must be a great deal of difference in the training methods adopted if this safeguard is considered necessary. However, this by no means detracts from the machine, and those who have tried it are in agreement with our opinion that it is one of the nicest they have tried. The view from either cockpit is admirable and the draught is far less than in most of our own machines; the luggage accommodation is large, although a trifle inaccessible. Incidentally we must correct a slight error which occurred in our issue of last week. We said that the Junkers F 13 had an open pilot's cockpit, which was very comfortable, now we are told that this has been enclosed, and though we have not tried it ourselves, we cannot imagine that it can possibly be any more comfortable than the old one.

The other machine was the new three-seater Cirrus-Klemm. The front cockpit is fitted to carry two passengers, and our representative, whose legs are longer than most people's, said that he found there was ample leg room, and though his fellow passenger was a somewhat bulky individual, he did not find that he was cramped at all. Machines of this type are, we believe, to be used in South Africa for short mail services.



ALL METAL: Mr. Trost (left) and Major Clarke, who brought over their delightful little Junkers Junior to the Reading Meeting. (FLIGHT Photo.)

LIVERPOOL AERO CLUB'S OPENING

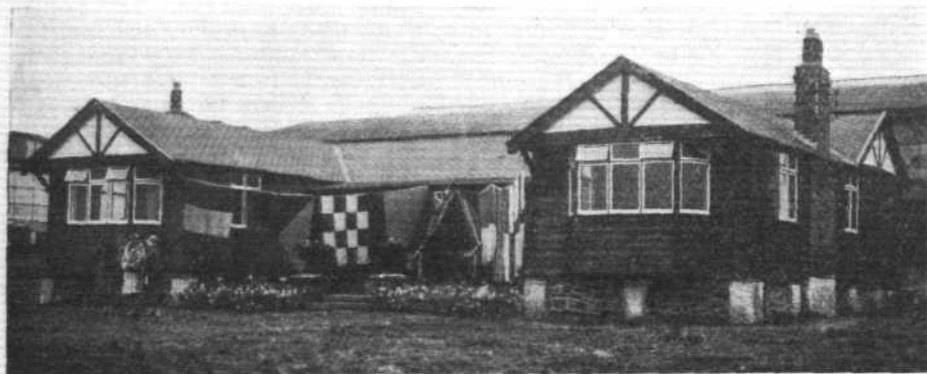
ON SATURDAY, April 5, Lady Bailey opened the new club-house at Hooton Park Aerodrome for the Liverpool and District Aero Club.

Quite a fair number of visitors arrived for the ceremony, and the occasion, we hope, will mark the opening of a very satisfactory season for the club.

There was no extended flying programme arranged, but a prize was given for a rally whereby the machine arriving nearest to the zero hour of 2 p.m. would be the winner. Capt. Norman Blackburn and Flt.-Lt. N. H. Woodhead, who came over in a Bluebird, were the winners, which fact was really rather funny, as they knew nothing about the Rally and merely happened to arrive within 30 sec. of the zero hour!

Col. H. Jerrett, the Chairman of the Club, and Mr. W. Harding, a trustee and patron, supported Lady Bailey, as she declared the club open by cutting a tape which was tied across the doorway.

The front of the club-house has been decorated by Mr. G. H. Dawson, the



Above: Lady Bailey, with Mr. Harding on her right, and Col. Jerrett on her left, declares the club-house open.

Below: A front view of the club-house.

On the right: Capt. Blackburn and Flt.-Lt. Woodhead smilingly acknowledge their skill in winning the Rally. (FLIGHT Photos.)



Chairman of Comper Aircraft, which has now started the first production batch of the Swift at the works which adjoin the aerodrome.

During the afternoon many people were taken up for joy-rides, and Flt.-Lt. Comper demonstrated the Swift.



Lady Bailey tries the cockpit of the Swift under the eye of Flt.-Lt. Comper. (FLIGHT Photo.)

We understand that the Swift has created a very good impression indeed at Martlesham, and probably this season we shall become accustomed to seeing Swifts wherever aircraft gather together.

HANWORTH CLUB have increased their flying rates to £3 per hour for dual instruction and £2 10s. for solo instruction from April 1. A course of technical instruction is being instituted at the Club, and will start on April 14. Those who are interested should get in touch with the Chief Engineer, N.F.S., Grand Buildings, Trafalgar Square.

THE BROOKLANDS SCHOOL OF FLYING have organised a flying display, and the opening of the new Brooklands Aero Club for Saturday, May 17.

A good programme has been arranged, with such pilots as H. Broad, J. Trantum, K. G. Murray, and it is hoped to fix up a number of competitions. An Auto-giro and several other interesting machines will be present on this occasion.

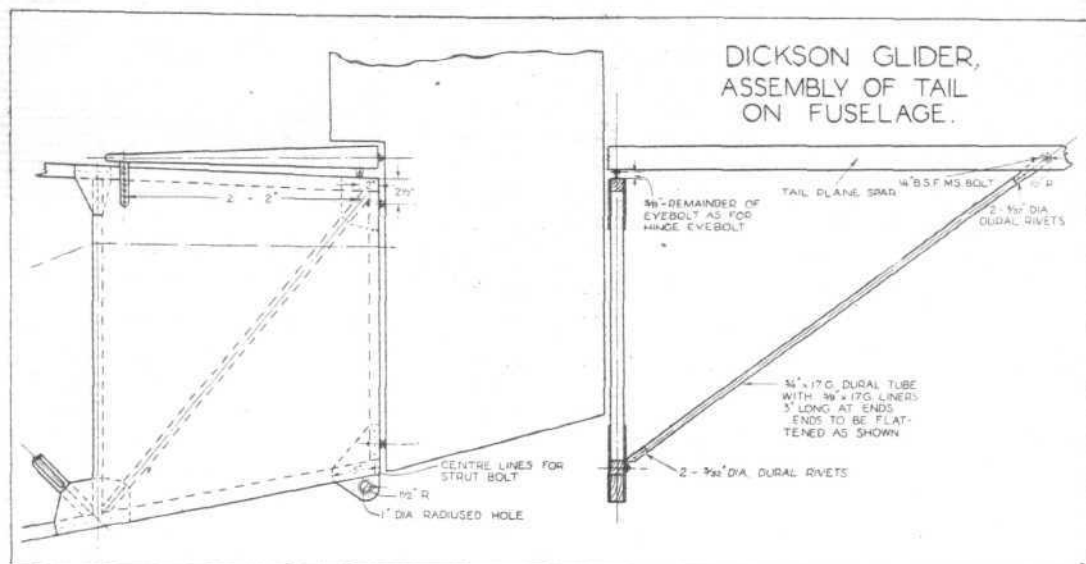
Mr. George Lowdell has now joined this school as an instructor.

THE HAMPSHIRE AEROPLANE CLUB got in 172 hrs. flying time during March, of which 80 hr. 20 min. was dual, 20 hr. 40 min. solo instruction, 62 hr. 30 min. solo by "A" pilots, and 8 hr. 30 min. passenger work, etc. Seventeen new members joined the club, and Lt.-Col. Hay, Lts. Torlesse, Bodoano, Montgomery, and Mr. Hayden completed the tests for their "A" licence.

Miss Grace, unfortunately, crashed the Spartan machine, but was lucky enough to escape without serious injuries to herself.

THE LEICESTERSHIRE AERO CLUB have planned a very ambitious programme, for their meeting on Saturday, April 19. Sir Samuel Hoare will formally open the programme at 2.15 p.m., although there will have been a considerable amount of flying before that time. No. 19 (Fighter) Squadron, from Duxford, will give an hour's display immediately after the official opening. There will also be some competitions open to pilots of various classes.

This diagram shows how the tail plane is mounted on the fuselage.



THE HALTON AERO CLUB. On Monday evening, March 24, a lecture entitled "Metal Construction and Aircraft," was delivered before the Halton Branch of the Royal Aeronautical Society, by L. A/A. Edward J. G. Jacobs, Stud.R.Ae.S. The house was comprised mainly of R.A.F. apprentices, and in his introduction the lecturer explained to them the many advantages of metal construction, and the inherent technical difficulties. Statistics were given which proved conclusively that steel was far and away the most universally developed material for the aircraft structures of the day. The lecturer remarked that he was surprised that all-wooden aircraft held second place in the numbers in use, solely duralumin came a close third, while composite constructions of all types, fourth. In the second part of his lecture, Mr. Jacobs made a brief survey of the all-metal products and peculiarities in design of the outstanding constructors of the day. Spar sections and ribs of different types were exhibited as well as photographs, pamphlets and specimens of interest. A discussion was called for, and the lecturer was able to answer questions with regard to either the lecture or exhibited specimens. Many thanks are due to those officers and gentlemen, too numerous to mention, who so kindly facilitated the production of the lecture. This was the first lecture of a series to be given by apprentices for which medals will be awarded annually. Among those present were:—Air Commodore I. M. Bonham-Carter, C.B., O.B.E.; Mr. J. D. Haddon, A.F.R.Ae.S.; F./O. C. H. L. Needham, M.Sc., F.R.Ae.S. (Hon. Sec.); Lieut.-Col. R. K. Pillers, O.B.E., B.Sc.; Dr. Reeve; Mr. F. J. Sangar, A.C.G.I. (Assistant Hon. Sec.).

THE DICKSON GLIDER. Last week we published the drawing for the fuselage of this glider and, unfortunately, the designer has informed us that certain dimensions were erroneous. These were:—the front member should have been 2 in. by 1½ in., and the top longeron and second two truss members should have been 1½ in. by 1½ in. The designer regrets that these errors were allowed to pass and hopes that no undue inconvenience has been caused to those building this glider.

BLACKPOOL are making an endeavour to have their aerodrome ready for a show at Whitsun, and are probably vesting the control of the aerodrome, when finished, in N.F.S.

THE NORTHAMPTONSHIRE AERO CLUB flew a total of 54 hrs. 40 mins. during March, of which 32 hrs. 45 mins. was dual instruction and 11 hrs. 55 mins. solo, with 10 hrs. for tests and joy-rides. Seeing that they have only one "Moth" in commission, this seems a very good effort. The membership has now increased by six flying members and 11 associates, to a total of 389.

GLIDING is rapidly creating great interest, and the latest fillip, besides that of Mr. Wallace Barr, is the *Daily Mail* announcement of their competition to be held in the summer of next year.

NORTHAMPTONSHIRE AERO CLUB had their new club-house opened by Sir Sefton Brancker on Sunday afternoon, April 6. The key used for the purpose was dropped to him by parachute from an aeroplane.

LANCASHIRE AERO CLUB. Activities commenced on Sunday, April 6, when a number of experimental flights were carried out with the club's Prüfling glider, to test the rigging and controls. Altogether, 15 flights were made and 10 pilots flew the machine.

The machine was catapulted off the level into a westerly breeze of 20-25 m.p.h. Seventy yards of ½-in. Sandow elastic was used and to avoid any risk of the elastic failing to become detached from the hook no loop was made in the centre. The Prüfling is considerably heavier and faster than the Zögling, and it was found that for a successful launch off level ground at least ten men were required on the ropes and two on each wing-tip to hold the machine back. As many as sixteen can pull on the ropes without causing any undue strain.

The wind was, unfortunately, in the wrong direction to enable the natural slope of the Aerodrome to be used. In consequence, it was impossible to achieve anything more than short flights, but a maximum of over 200 yards in distance and over 15 seconds in duration was achieved.

The Prüfling showed itself a very handy machine in the air, the only criticism being that the elevator controls were very light and powerful as compared with the rudder controls, which were distinctly sluggish in action. The normal flying speed of the machine is about 25 m.p.h., and owing to the strength of the wind it was landing at a very low ground speed. In these conditions it showed no tendency to swing upon one wing-tip, nor did it give any indication that it might be blown over, even when left deliberately on one wing-tip across wind.

The following pilots flew the machine in the order named:—A. Goodfellow, F./O. Tomkins, R. H. Dobson, R. F. Hall, J. C. Weale, B. A. G. Meads, A. C. Mills, J. C. Lister, H. C. Greg.

Preliminary practice will take place on the aerodrome at 3 p.m. on Sundays (weather permitting) until further notice, pending the completion of negotiations for a suitable site in the hills.

THE CINQUE PORTS FLYING CLUB were unfortunate with the weather during the week ended April 5, and only managed to get in 15 hrs. 5 min. flying time. Two new members, Messrs. Cliff and Waller, made their first solo flights, and on Sunday, the 6th, the third competition for the Ashwell-Cooke cup was run off. Mr. Jackaman and Mr. Cazalet visited the club for the competition, but were not successful in beating the excellent score put up by Mr. Dallas Brett. Mr. Law was also flying, but like Mr. Cazalet, he was flying an unfamiliar machine, which was undoubtedly a handicap. Mr. Broad also came down and gave an excellent aerobatic display on his single-seater Moth.

THE BRITISH SCHOOL OF GLIDING is the title of a new company to be formed for the purpose of providing training for those who wish to become glider pilots. The school will probably be within an hour or two of London.

MR. A. J. A. WALLACE BARR, on behalf of Cellon, Ltd., of Kingston and Richmond, has offered the British Gliding Association a prize of £1,000, to be competed for under the rules of the Royal Aero Club, for the first All-British glider flown by a British pilot which crosses the English channel between June 1, 1930, and May 31, 1932.

Full conditions and regulations will be announced later.

Mr. Wallace Barr, who has taken great interest in aircraft since the very early days, offered a prize, in 1922, of £50 for a glide of 50 miles in a straight line. This prize, which has not been won, is still open.

MIDLAND AERO CLUB. Notes on aircraft and engine maintenance by the Chief Engineer, Midland Ae.C.

ENGINES:

3 Cirrus Mark I, hr. to date	..	..	..	2,560
4 Cirrus Mark II, hr. to date	..	..	..	1,488
Total	..	..	..	4,048

OVERHAUL PERIODS: top, 120 hrs. Complete, 300 hrs.

Complete overhauls are carried out by the makers.

Daily inspection as follows, if previous day's flying exceeds 1½ hrs.:-

Compression checked, tappets checked and adjusted, valve stems and rockers lubricated, contact breakers checked, cylinder heads and induction pipe inspected for cracks, general inspection of installation.

Routine carried out after each 20 hrs. of flying:-

Sump drained and refilled with new oil, clean plugs fitted, contact breakers cleaned and adjusted, distributors cleaned, magnetos, impulse starter, oil and petrol filters cleaned.

REMARKS.

Forced landings owing to mechanical failure, two.

(a) Broken valve rocker.

(b) Stripping of magneto distributor gear.

The engines are run on mineral oil, and in nearly every case have been fully efficient up to the 120 hrs., but much in excess of this is liable to result in burned valve seats which would need to be heavily recut or replaced.

Before doing any work on the heads they are tested for loose valve seats by filling the exhaust and inlet ports with petrol and inspecting for leakage between the valve seats and the head casting. The pistons are also carefully inspected for cracks around the gudgeon pin bosses.



THE BUZZARD. An American light plane. ABC Scorpion engine. Speed range 60-25 m.p.h. on full load, 340 lb.

The engines are usually running well at the 300 hrs., and it would appear that the complete overhaul period might now be extended to at least 375 hrs.

One engine, Cirrus Mark I, No. 6, has completed 1,062 hrs. running since built, and is running as well as when new.

AIRCRAFT—MOTHS—Total hours to date, 4,000.

Complete overhauls are carried out in most cases by the makers once each year for renewal of C. of A.

Daily inspections as follows:-

All flying controls, tail skid, wing root fittings, fabric (for tears), Raf wires (for tightness and rusting), undercarriage.



THE LINNET. Built by the Experimental Light Plane Club, under way on a towed flight.

The wings are folded about every 30 hrs., and hinge points and locking bolts inspected.

REMARKS.—Forced landings owing to mechanical failure 1. Owing to breakage of R.H. lever on rear elevator rock shaft. This put the R.H. elevator out of action, but the machine was fully controllable in the air, but lacked sufficient elevator control to prevent landing on wheels. The undercarriage buffer struts need very little attention and are not disturbed unless they show signs of needing lubrication, this is carried out with graphite grease, and it is an advantage to slightly smear the inside of the cylinder with oil before assembling as this prevents grease from hardening after a short period.

When the machine is engaged on "landing dual," the tail skid should be watched for chafing of the check cable, and spring breakage, and cracking of the shoe. The fitting attaching the tops of the compression legs to the fuselage should be inspected after bad landings, and removed if damage is suspected. It may be found that the tierods through the fuselage are bent, and the holes in the longerons elongated. The radius rod lugs on the fuselage should also be inspected for movement. It also sometimes occurs that a bad landing will cause splitting of the rear ends of the control box sides.

On the wooden Moths short lengths of longeron may be inserted and fish-plated to the existing longerons where the local damage has occurred.

THE DORSET GLIDING CLUB which, as we announced last week, was inaugurated on April 3, has now received the very generous gift of a glider from a prominent Weymouth business man, and the order having been placed, the machine is expected to be ready for Easter. The club will be affiliated to the B.G.A. Mr. Norman Wright has been elected chairman, Mr. Campbell Johnson, secretary, and Mr. D. Trapp, treasurer. An appeal for funds is being launched in the county and the subscription has been fixed at one guinea, with an entrance fee of 2s. 6d. until June 1, after which it will be 10s. 6d. All who are interested should get in touch with the Hon. Secretary, Mr. Campbell Johnson, 4, Derby Street, Weymouth.

THE AIR MINISTRY announces the following candidates, whose names are given in alphabetical order, have passed the examination for 2nd Class Air Navigators Licences, held at the Air Ministry, on March 24, 25 and

26:-Mr. P. Bailey; Flt.-Lt. L. K. Barnes, R.A.F.; Mr. F. V. W. Foy; F/O. A. E. Hill, R.A.F.; Flt.-Lt. I. W. C. MacKenzie, R.A.F.O.; Flt.-Lt. M. C. Pascoe, R.A.F.; Mr. P. Phillips; Miss W. E. Spooner; Miss F. M. Wood. The subjects of the examination were: International Legislation—Form of the Earth, Maps and Charts—Meteorology—Dead Reckoning and Direction Finding—W/T Navigation—the Earth's Magnetism and Compasses—Visual Signalling. To be successful, candidates were required to obtain 70 per cent. of the aggregate marks, and not less than 60 per cent. in any one subject.

AIRISMS FROM THE FOUR WINDS

The Duchess of Bedford Flies Solo

THE Duchess of Bedford, who, as previously announced in FLIGHT, had planned to leave England on Thursday for a non-stop flight to Africa, made her first solo flight on April 8. She flew her own "Gipsy-Moth" near her home at Woburn Abbey, Bedfordshire. She is very keen on obtaining her "ticket," and just lately has been receiving instruction at the hands of Capt. Barnard and Mr. S. St. Barbe. So far she has done 30 hours' dual flying!

Piper and Kay Reach Sydney

FLYING OFFICERS H. L. PIPER and C. E. KAY, who reached Port Darwin from England on March 23, in their Desoutter cabin monoplane ("Cirrus Hermes"), have arrived at Sydney.

Mr. Van Lear Black Reaches Tokio

MR. VAN LEAR BLACK has concluded the outward section of his Eastern Air Tour, which started from Croydon on February 8. He was flying in his three-engined Fokker monoplane, with Mr. Geysendorffer and Mr. Scholte as pilots. Osaka was reached on April 4, and on April 7 he arrived at Tokio, his destination.

New York-Bermuda Flight

MR. BOUCH, who, as reported in last week's FLIGHT, left New York on April 1 in his Stinson seaplane, piloted by Mr. W. Alexander and with Capt. Lewis Yancey as navigator, with the object of flying non-stop to Bermuda, arrived there the following morning. Actually, they came down in the sea, some 60 miles north of their objective the night before. Fortunately, the sea was calm, and they spent the night afloat—having sent out a wireless message stating that they intended proceeding in the morning. At daybreak they took off, but shortage of fuel brought them down again a few miles from the shore. Fresh supplies were sent out by motor boats, and after re-fuelling on the water they flew into harbour.

Mr. Alan Butler's Progress

MR. AND MRS. ALAN BUTLER, who left Heston for Rhodesia on March 20 in the Aircraft Operating Co.'s Gloster Survey machine (Bristol "Jupiters"), arrived at Tabora, Tanganyika, on April 5 and Broken Hill on April 8.

First Flight to Zanzibar

ON April 7, Capt. Campbell Black flew a Wilson Airways aeroplane to Zanzibar. This is stated to be the first time an aeroplane has landed on the island.

The Prince to Fly to Cairo

It is officially stated that the Prince of Wales will fly from the Sudan to Cairo, arriving at the latter place on April 17. He will then proceed home in a P. & O. liner from Port Said on April 20. It was arranged that a Fairey IIF biplane should convey the Prince from Lotti to Juba, whence he will journey by ordinary transport to Khartoum.

M. Prevost Killed

THE well-known French pilot, M. Prevost—winner of the first Schneider Trophy Contest and holder of several air records—was killed at Perpignan aerodrome on April 2. M. Prevost, accompanied by his mechanic Hoff, were carrying out tests with a new three-engined commercial flying-boat, when, according to reports, some part of the machine broke and it crashed into the sea from about 1,200 ft., and both occupants were killed, or drowned. The loss of M. Prevost is a serious one, not only to France, but to the aviation world in general.

The "Tiger Moth" in Australia

THE record making "Tiger-Moth," which was recently sent out to Australia, has now passed into the possession of Mr. Frank Bardsley, of Sydney.

Reception in Honour of Sir Philip Game

A RECEPTION in honour of Air Vice-Marshal Sir Philip Game, Governor-Elect of New South Wales, and Lady Game, was held by the Agent-General for New South Wales and Lady Fuller at Australia House on April 2. Three hundred guests attended.

A German Light 'Plane Record

LAST week the German pilot, Nehring, established a new German altitude record at Darmstadt by reaching a height of 26,418 ft. in a single-seater light 'plane.

New Geneva-Budapest Air Service

A NEW passenger and mail air service between Geneva and Budapest, via Zurich, Munich and Vienna, which takes 10½ hours for the complete journey, was opened on April 1.

Damascus-Baghdad Air Mail

THE Air Union inaugurated an air mail service between Damascus and Baghdad on April 2.

Sir Stanley White's Gift

SIR STANLEY WHITE, of the Bristol Aeroplane Co., Filton, has given a model of a Bristol "Bulldog," about 2-ft. span, to the Art school at Harrow School.

A New Zealand-Built Monoplane

MR. JOHN ALLISON, a young New Zealander of Whakatane, has constructed a monoplane on which he has made several successful flights.

An Aerodrome for Speke, Liverpool

THE Air Ministry has been invited to approve a scheme for providing Liverpool with an aerodrome at Speke, on the Lancashire banks of the Mersey.

A Luft Hansa Accident

A LUFT HANSA machine, operating on the Frankfurt-Cologne route, crashed in the fog in the woods near Idstein (Wiesbaden) on April 4. The pilot and the only passenger, a nurse of Cologne, were badly injured.

Fatal Crash at Feltham

ON Sunday, April 6, Mr. George Edward Watts, aged 28, of Totnes, Devon, who was home on leave from Nigeria and was learning to fly, crashed when flying solo in a Bluebird belonging to National Flying Services, Ltd., and died as a result of his injuries. The fuel caught fire when the machine crashed, and the pilot was pinned underneath the wreckage. Two men of the Royal Army Service Corps, Driver Hillyer and Sergt. Hanlon, assisted by a civilian, showed the utmost bravery in lifting the tail of the machine and pulling the pilot clear. Mr. Watts died on the way to Hanworth Cottage Hospital. At the inquest, when a verdict of accidental death was returned, the jury added a rider to the effect that "they considered pupils should have longer tuition before being allowed to fly solo. They did not think that the time spent by Watts was long enough tuition." We do not know whether there was an aeronautical expert on the jury, and the probability is there was not, so that this opinion is most likely a lay one. An immense amount of harm can be done by such expressions, as the public are bound to think that flying instruction is being given in a slipshod manner, and once such an idea gets about there is sure to be an adverse effect on club flying. On the showing of N.F.S., Watts had had 17½ hours' dual and 4 hours' solo, while in many schools the average time of dual instruction before a man flies solo is 5 hrs. It is therefore a very strong statement to say that he could not have had sufficient training. No instructor dares to let any man go solo before he considers he is fit to do so, for the dire results are only too well known, and to suggest that N.F.S. were negligent on this score is a very serious matter indeed, which should require to be proved when such a statement is made. We cannot help thinking that expressions of opinion on such matters should only be made in public when the author is thoroughly qualified.

India Air Mails Summer 'Time Table

THE Postmaster-General announces that the summer time-table of the through air service between this country and India will come into force on April 12. The latest time of posting at the General Post Office, London, will be 6 a.m. on Saturdays, as at present. The latest time of posting in the Provinces can be ascertained locally. The mails will be due to arrive as follows:—At Alexandria on the following Monday evening; at Gaza on Tuesday morning; at Baghdad on Tuesday evening; at Basra on Wednesday morning; at Karachi on Friday afternoon; and at Delhi on Saturday evening. This represents a considerable acceleration to all places on the route, not only as compared with the winter time-table, but with the timings in force last summer. In the homeward direction, the air mail will be due to leave Delhi on Monday, and Karachi on Tuesday, and to arrive at Croydon on Monday evening. The public are reminded that the present air fees—in addition to ordinary postage—are as follows:—

To Egypt and Palestine, 2d. per ½ oz.; to Iraq, 3½d. per ½ oz.; to Persia, 5d. per ½ oz.; to Karachi (with onward transmission by ordinary route), 5d. per ½ oz.; and to Delhi, 7d. per ½ oz. The new accelerated time-table involves the cancellation of the service by which letters could be sent by the ordinary Indian Mail Service via Marseilles on Thursdays and conveyed by air from Gaza to Baghdad and Basra, at a special air fee of 3d. per oz., as the connection is broken. Letters for Baghdad and Basra can, however, be posted a day later, and obtain the same time of delivery by the Direct Indian Air Service, but it should be noted that the air fee is 3½d. per ½ oz., in addition to the ordinary postage.

AIR TRANSPORT

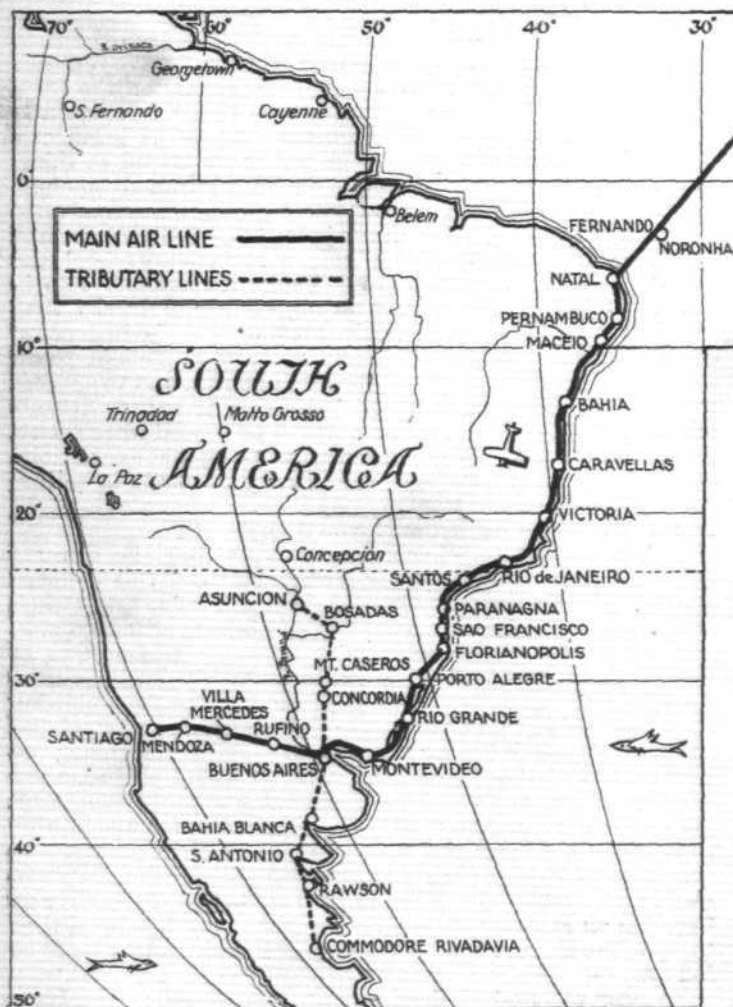
THE TECHNICAL ORGANISATION OF THE CIE. GENERALE AEROPOSTALE

MONSIEUR P. GRIMAULT, on April 3, delivered a lecture before the Royal Aeronautical Society and Inst. Aeronautical Engineers on the Technical Organisation of the Cie. Générale Aéropostale. As the main service operated by this company is the important one from France to South America, the following report on this lecture should be of general interest.

In opening his lecture M. Grimault gave a summary of the company's service, viz. :—

The ground covered by the Compagnie Générale Aéropostale comprised the following :—(1) The main air line from France to Chile *via* Toulouse, Casablanca, Saint Louis, Natal, Rio de Janeiro, Buenos Aires, Santiago. (2) The tributary lines: Bordeaux-Toulouse; Marseilles-Barcelona; Buenos Aires-Asuncion; Buenos Aires-Commodore-Rivadavia. (3) The line Marseilles-Algiers. (4) The line Paris-Biarritz-Madrid. Flying on this east route was suspended during the winter and renewed in May.

The following gives the distances covered on the main



route :—Toulouse-Casablanca, 1,845 km.; Casablanca-Dakar, 2,850 km.; Dakar-Natal, 3,200 km.; Natal-Santiago, 5,850 km. Total, 13,745 km.

The subsidiary distances were :—Bordeaux-Toulouse, 215 km.; Marseilles-Barcelona, 495 km.; Buenos Aires-Asuncion, 1,100 km.; Buenos Aires-Commodore-Rivadavia, 970 km. Total, 2,780 km.

And for the following lines :—Marseilles-Algiers, 800 km.; Paris-Madrid, 1,200 km. Total, 2,000 km.

The total network of lines actually developed by the



Sketch map showing the air services operated by the Cie. Générale Aéropostale.

company was 18,325 km., and it was entirely operated by aeroplanes or seaplanes, except for 3,200 km. on the South Atlantic portion of the route. Each part of the route, said M. Grimault, had its own special difficulties. The journey from Toulouse to Casablanca involved crossing the Pyrenees through the Perthus Pass at a height of 1,000 m. The summits of the Pyrenees were often covered with snow and hidden by mist, which provided the first serious obstacle on the main route, so that aircraft had to fly high.

Afterwards the line followed the Spanish coast where the Sierra came down to the sea. The rocky coastline offered no facilities for a forced landing, and the making of landing grounds was not easy. From Tangiers to Casablanca the chief trouble was due to the frequent mists on the west coast of Africa. The journey from Toulouse to Casablanca was made daily each way, and was available for passenger traffic.

From Casablanca to Dakar the route followed the coast and covered for a large part of the journey from Agadir to Port Etienne desert country where the Spanish posts of Villa Cisneros and Cape Juby were the only landing places where fresh supplies could be obtained. Outside these posts the desert was infested by hostile tribes who held to ransom anyone who fell into their hands.

Flying conditions were often not very good, and the high temperature made it necessary to take particular care over the fuel supply and cooling of the engines. Mist or haze was very prevalent on all the coasts. Sand storms were frequent and were a source of considerable trouble and were the cause of wear and tear of the engine through the particles of sand sucked in.

The problem of crossing the Atlantic, he said, had not, up to the present time, been solved commercially, and he returned to the subject again later.



The Cordillera (Andes) as viewed from one of the Aéropostale machines operating between Buenos Aires and Santiago.

The route from Natal to Buenos Aires followed the South American coast line. In places the forests came down to the seashore, whilst in others the coast was rocky. Moreover, in that tropical climate the formation of thick clouds was accompanied by heavy torrential rains, which restricted visibility and made flying difficult. M. Grimault added that an enormous amount of work had been found necessary to clear the luxurious tropical growths in order to prepare landing grounds in the forests and involved daily attention to keep them clear.

Between Buenos Aires and Santiago, or more exactly between Mendoza and Santiago, was the formidable barrier of the Andes, many of the passes of 4,000 m. in height. The Pacific gales caused such violent descending currents that it was necessary to fly at least 5,000 m. to cross the Andes.

The journey from Casablanca to Santiago was only flown once a week in each direction.

The Organisation of the Routes

The landing grounds had been fixed from the beginning, taking into account the commercial and postal necessities, and of the material at the company's disposal. At first Salmson-engined aircraft were used, but since 1927 the Breguet 14 was specially fitted and used. This allowed a longer maximum stage of 600 km. Actually it would be possible to make still longer stages and a certain number of primitive landing grounds, in particular on the journey between Casablanca and Dakar, served for emergency landings, enabling the length of the intervening flights to be extended to 1,000 km.

The compulsory landing grounds were Barcelona in Spain, Tangiers, Rabat, Casablanca, Agadir in Morocco, Pernambuco, Bahia, Rio de Janeiro and Montevideo in South America.

M. Grimault described the method of working as

follows:—each aerodrome had one or two aircraft in reserve. When an aircraft landed one of the reserve aeroplanes was ready to take off and passengers and freight were transferred.

This method of working had been adopted since it reduced to a minimum the time spent at the aerodrome. By this method the aircraft used in turn reached the headquarters at Toulouse and Buenos Aires. Thus, each aerodrome always had its proper quota of aircraft which, however, was constantly changing. All aircraft had equal service and were maintained and overhauled as regularly as required at those aerodromes where there was the necessary technical organisation. The workshops and chief supply depots were at Toulouse and Buenos Aires.

At Toulouse major repairs and overhauls were carried out under the supervision of the Société Industrielle d'Aviation Latécoère. At Buenos Aires the workshops belonged to the Compagnie Generale Aeropostale and there complete overhauls could be carried out of engines and aircraft, as well as the construction of the chief parts of aircraft. There were small workshops at Casablanca, Rio de Janeiro and Marseilles.

The fitting up of the aerodromes did not call for any particular comment; they were all equipped for night arrival and departures. The red ground beacons were placed 30 cm. above the ground and all obstacles had similar beacons fixed on them. The lighting of the aerodrome was by means of mobile searchlights, most of the Brandt and Fouilleret type.

Each aerodrome had a lighthouse beacon. These beacons were provided with 3,000-watt lamps, and under normal conditions could be seen at a distance of 100 km. They were each lettered on the top by a small flashing light to indicate the name of the aerodrome to the pilot. The full organisation for the routes for night flying required beacons between the aerodromes, and these beacons were now in the course of construction. The actual parts of the route now equipped were those from



The Aconcagua peak, in the Andes, which is 7,200 m. high.

Bordeaux-Toulouse, Perthus and Tangier and Casablanca. The ground from Barcelona to Perthus should be ready very shortly.

Wireless Organisation

M. Grimault said he thought the wireless service of the company the most efficient private wireless service in existence. The service aimed to provide the following:—

1. To enable constant communication between the various aerodromes—(a) To allow the management to communicate without delay to every point (network of management). (b) To give regular communication to ensure the proper supply of material and personnel (network of service). (c) To ensure that all meteorological information necessary for safe flying could be obtained and that communication between aerodromes for that purpose could be carried out (network of safe flying).

2. To enable pilots to keep in touch with aerodromes, and ultimately, with one another (wireless air network).

3. To enable aircraft to be navigated by directional wireless.

4. To allow the dispatch and relief boats of the company on one part, with the ground organisation on the other part, to keep in touch with the seaplanes in flight.

The means for attaining these different ends were as follows:

1. On the ground. Each aerodrome had a wireless station comprising:—(a) A transmitter to send out short-waves (15 m. to 60 m.) and long-waves (400-2,000 m.). The power for these wireless transmitters varied according to the aerodrome from 100 watts to 1 kw. on the aerial. (b) A receiver to enable an operator to listen in on wave-lengths from 15 m. to 3,000 m. and to receive directional wireless signals from 200-3,000 m.

To this receiving apparatus were added two receivers of small range for emergency help calls (one for short and one for long-waves). By this means several people could listen in at the same time at each aerodrome.

Generally the managing control was enabled by short-wave transmission and reception to keep in direct touch with the following places where there was wireless apparatus of at least 500 watts in the aerial: Paris-Toulouse-Casablanca (in preparation), St. Louis, Porto-Praia-Natal-Rio de Janeiro-Buenos Aires-Santiago-Asuncion-Bahia-Blanca-Commodore-Rivadavia. This network worked in with those for supply and navigation through Casablanca-Toulouse and Marseilles.

The liaisons between the intermediate commands were on short-wave wireless (100-200 watts power). The stations of the chief network enabled direct communication between any two stations. In this way Paris and Toulouse communicated direct with Buenos Aires and Rio. Practically, however, messages for America were sent during the day via St. Louis for Praia and Natal; at night they were sent direct or via



A fleet of Latécoère 26 monoplanes used by the Cie. Generale Aeropostale on their France-South America air route.

Natal. The wave-lengths used were those of the Navigation Aérienne or 26.7 m., 37 m. and 57 m. for the stations on the chief wireless network.

Wireless communication to ensure the safety of the aircraft was on long wave-lengths, by such stations at each aerodrome which had 500-750 watts power, except for certain stations particularly close together, where the power used was only 200 watts. The wave-length for traffic was 1,400 m.

Nevertheless, at the aerodromes where there was known to exist an organisation of the S.N. Ae.—Paris-Biarritz-Toulouse-Perpignan-Marseilles-Ager-Casablanca-Bordeaux—there was no organisation for long waves, the Government service being used.

The directional wireless network already assured by the existing apparatus at all aerodromes was completed by certain stations on the line of flight of the aircraft (for example, San Juan in the Argentine). This arrangement was, moreover, supplemented in certain cases by stations of the Navigation Aérienne (for example, Oran). All the wireless apparatus owned by the company was for continuous waves. The service was only carried out by telegraphy (continuous or I.C.W.).

2. The apparatus carried by each aircraft for transmission varied from 50-150 watts, and for reception from four to seven valves, according to the radius of action of the aircraft. All the apparatus could in the main be used for long or short waves, the traffic being carried out on C.W. or I.C.W.

In principle the aircraft were equipped with wireless apparatus of 225 watts supplied by a generator with three commutators (8, 20 and 1,500 volts) driven by a small wind-mill. This equipment was to ensure transmission in flight, to charge the battery and also for transmission in case of a landing. For this transmission an aerial was slung between bamboo supports carried to the ends of the machine.



Another type of machine, the Latécoère 28, used by the Cie. Generale Aeropostale.

Erection and repair shops were in course of construction at Toulouse and Buenos Aires. This important network was now working regularly and had increased greatly the ease of operation of the route and added considerably to the safety.

Aircraft

The aircraft used were now almost all specially provided by the Société Industrielle d'Aviation Latécoère for the special needs of the Compagnie Generale Aeropostale. Two types were used—one with an enclosed cabin for four passengers; the other more for postal work, but capable, nevertheless, of taking four passengers in an open cockpit; one other variation of the same machine gave a range of 1,400 km. with the smallest commercial load. Both were parasol monoplanes with one pair of struts on each side. The wing and fuselage construction of duralumin spars and tubes followed the standard practice.

Climatic conditions had led the company to carry out research with a view to getting rid of rubber cord shock absorbers. The undercarriages were provided with shock absorbers of two types, one steel springs made by the Société des Forges de l'Ariège, and the other the Messier Oleo gear shock absorber.

The chief characteristics of the aircraft were as follows:—

Latécoère 25: Total weight, 3,285 kg.; commercial load, 824 kg.; range (at cruising speed), 700 km.; top speed, 190 km. an hour; cruising speed, 155 km. an hour.

Latécoère 26-2: Total weight, 3,364 kg.; commercial load, 788 kg.; top speed, 195 km. an hour; cruising speed, 150 km. an hour.

The Latécoère 26-6 was a variation of the same aeroplane, but the weight of fuel carried was increased from 681 to 1,113 kg., the range increased from 800 to 1,400 km., and the commercial load reduced to 260 kg. All the aircraft used Renault 450-h.p. 12-cylinder water-cooled engines. The bare weight was 350 kg.

The 450-h.p. Renaults had flown 30,000 hours, and no disaster or trouble had been caused by engine breakdown, but solely due to the meteorological conditions.

On the route from Buenos Aires to Santiago, which crosses the Andes, Potez 25's with Lorraine 450-h.p. engines were used, the same type used in the French Air Force.

Actually the company used new aircraft constructed by the Société Industrielle d'Aviation.

Latécoère 28 was a braced monoplane with cabin accommodation for eight passengers. Its chief characteristics were as follows:—Total weight, 4,040 kg.; commercial load, 950 kg.; top speed, 238 km. an hour; cruising speed, 200 km. an hour; range (at cruising speed), 800 km.

It was fitted with either a 500-h.p. Hispano or a 500-h.p. Renault. (Both engines geared.) M. Grimault remarked that this aeroplane was the fastest commercial aeroplane in use at the moment, for its speed of 200 km. an hour had not only been maintained, but often surpassed.

The air fleet of the company consisted of about 100 aeroplanes of the Latécoère 25 and 26 types and 17 Latécoère 28's. This number would shortly be increased to 33. To that must be added ten machine of various types, of which three Potez were used for crossing the Andes, and 70 machines of older makes held in reserve.

The oceanic crossing between Dakar and Natal was by means of fast boats, which would be used until the Atlantic service had become regular. Six boats had been lent for this purpose to the company by the Marine Nationale. They were about 1,000 tons displacement, and were driven by 6,000 h.p. turbines, and attained a speed of 16-18 knots.

The company's own fleet consisted of these six dispatch boats, of four rescue steamers displacing 350-650 tonnes, two water tankers, two oil tankers, and 10 motor boats.

The company would put into service, during the summer of 1930, four new units, to serve the flying-boats which would be able to make the air journey across the ocean.

Results

The results obtained on this service were as follows:—The post took 8½ days to reach Santiago, against the normal time by other means of transport of about 25 days. For Montevideo and Buenos Aires the time was 7½ days, against 18 days. The average time from Natal to Buenos Aires was 47hr. 30 min., and the best time in summer 31 hr. 25 min. From Toulouse to Dakar the average time was 40 hr., and the best 27 hr. 15 min.

Taken all round, the fastest journey in summer had been that of the Comte de la Vaulx, of which the following were the times.

Leaving Toulouse at 6.20, the mail arrived at Casablanca in 8 hr. 20 min., after landing at Barcelona and Alicante.

Leaving Casablanca at 14 hr. 45 min., Dakar was reached the following morning at 9.50; from there the journey was continued on the boat *Peronne*, reaching Natal at 22.20 hr., and from there Buenos Aires was reached on the 23rd at 19.35 hr.

On the route from Natal to Buenos Aires the percentage of scheduled departures to the arranged time-table had been 94, and the percentage of arrivals less than 48 hr. late, had been 82. On the Toulouse-Dakar section the corresponding figures were 100 and 90.

Crossing the Atlantic

It was necessary to consider crossing the Atlantic without landing, for the Cape Verde Islands had no sheltered roadsteads suitable for the getting-off of seaplanes. Saint-Paul Rock and Fernando de Noronha Island were also unsuitable, and, further, the latter was less than 300 km. from Natal.

In order to cross the Atlantic the Company had under construction seaplanes of 10 tonnes, with a range of 4,000 km. and a commercial load of 500 kg. These seaplanes would be ready during 1930.

Other machines in course of construction should enable a useful load of 1,000 kg. to be carried for the same distance, and then Buenos Aires would be within five days of Paris.

Résumé de Work carried out

	1928.	1929.
Weight of postal matter carried.	Kg.	Kg.
On the service France to South America	2,732	8,943
Total of all service	82,610	84,040
Weight of goods carried	17,470	28,602
Number of passengers carried	870	1,116

Total receipts in 1929 were 18,524,929 fr., of which 16,881,789 fr. was for the postal services. The service France-America was subsidised to the amount of 10,653,094 fr.

The total personnel of the company was 1,250 persons, of which there were 85 pilots, 120 wireless operators, and 280 mechanics.

Upkeep of Apparatus

When the service was started overhauls were made every 100 hours as a measure of precaution. This time had been increased progressively to 250 hours, which was the figure adopted in practice. The overhauls consisted chiefly in cleaning or replacement of minor parts. Many of the motors had flown more than 600 hours without requiring attention to the cylinders or crankshaft bearings. Castor oil was used.

There was no fixed rule for the aircraft in practice; except for accidental damage, only the fabric required replacement. On the aircraft used in the Sahara and in tropical climates the fabric was replaced at the end of about 500 hours.

Night Flying

Night flying was undertaken as a general practice, but no special statistics were kept. The rule for the service in America was to proceed with the greatest possible despatch, having regard to atmospheric conditions. The departure from Buenos Ayres was regularly made at midnight.

On the average, each service to America did from 10 to 20 hours of night flying, which represented about 160 hours per week in summer and nearly 10,000 hours per year on the route where only short sections were actually equipped specially for aerial navigation.

The Line Marseilles—Algiers

In conclusion, M. Grimault referred to the route from Marseilles to Algiers. On this route machines flew six times a week in each direction. Violent and sudden storms made the operation of the route particularly difficult at the end of winter and the beginning of spring over the Mediterranean.

Twin-engined seaplanes, either Cams or Latécoère 32's were used. The Cams were fitted with 500-h.p. Hispanos, or geared Jupiters of 480 h.p. The weight all up was 650 kg., and their commercial load 300 kg., top speed 205 km. per hour, and average speed 155 km. per hour.

The Latécoère 32's were fitted with 500-h.p. Hispanos, and their top and cruising speeds and commercial loads were similar to the Cams. Their all-up weight was 7,500 kg., and the crew consisted of a pilot, a wireless operator and a mechanic. The company had five Cams and four Latécoères.

The average time for the journey was 5½ hr., and the quickest time 3 hr. 50 min. The percentage of departures to scheduled flights was 86, and of arrivals 80. In this percentage were included those machines which landed the same day of leaving.

AIRSHIPS

MONTREAL AND R 100

CANADA is stated to be tremendously interested in the forthcoming visit of R 100 to Montreal. No British airship has hitherto visited the Dominion, for R 34, on her historic trip, went to New York. A great reception is being prepared for the officers and crew in Montreal, and a reception committee has been organized by the Advertising Club of the City. One of the directors of this club, Mr. C. Gordon Brown, is also secretary of the Montreal Light Aeroplane Club. The Premier of Quebec Province, the Hon. Mr. L. A. Taseherean is one of the reception committee, and the Board of Trade and the Chambre de Commerce are co-operating, as well as the Departments of National Defence and Civil Aviation at Ottawa. The Mayor of Montreal, Mr. C. Houde, has promised that the city will do its part in giving all the support and backing necessary on such a historic occasion.

The airship mooring tower at St. Hubert Field, Montreal, is, in some details, an improvement on the tower at Cardington. The main structure was manufactured and erected locally, but the mooring head was shipped out from England. The total height is 205 ft., namely, 5 ft. higher than the tower at Cardington. The differences are intended to provide for mooring the larger airships of the future. The St. Hubert mast, according to a paper read recently by Mr. R. de B. Corriveau, of the Canadian Department of Public Works, at the annual meeting of the Engineering Institute of Canada, has been designed to withstand a pull of 90,000 lb. at the tower head. As R 101 exerted a pull of 33,600 lb. on the Cardington tower when riding out the gale which gusted up to 82 m.p.h., the factor of safety of the Montreal tower is certainly ample for present needs. The winch drums accommodate 2,000 ft. of cable for the nose mooring and 3,000 ft. for each of the side guys. The hydrogen plant is capable of supplying 60,000 cub. ft. of gas per hour. It is anticipated, according to Mr. Corriveau, that one-tenth of the gas of the airship will need to be replenished after the

flight across the Atlantic. The tower has been completely equipped by the Department of National Defence with radio, wireless, and meteorological services. It is painted black and chrome orange, to give the best possible visibility, a colour scheme similar to that of the pylons in the Schneider race.

ZEPPELIN SERVICE PROJECTS

Dr. Hugo Eckener is busy on two projects for air services across the Atlantic, one to North America and one to South America. There is also a scheme afoot for linking Pernambuco, in Brazil, with Lakehurst, and so establishing a circular route.

It is now several years since the German-Spanish Company, Transaere Colon, was formed with the object of running airships between Seville and Pernambuco. In connection with this company, the airship "Graf Zeppelin" is to fly to Seville this month, and, after making a series of cruises from this base, she is to start about May 10 across the Atlantic to Brazil. It is stated that a German mooring tower has been sent out to Pernambuco. A flight is to be made over Rio de Janeiro, and then the airship will fly up to Lakehurst before returning to Europe. The trip is to take about three weeks, and is regarded as a test flight on the South Atlantic route.

As regards the service to the United States, important American financial interests are said to be backing this project. A report from New York states that three commercial airships are to be built, two in America (presumably by the Goodyear Corporation), and one in Germany. The latest report is that, after all, the American terminus will be Lakehurst, New Jersey, which a previous message said that Dr. Eckener had condemned. A further statement that a start is to be made in building the three airships within a month, and that they will be equipped with gear for dropping and picking up aeroplanes, should, perhaps, be received for the present with caution.

"FLAT OUT"

"FLAT OUT," in all senses, never have we seen a crowd so literally, flat out. The Halton Debating Society were certainly flat out, when they gave their comic opera, with the above title, at Halton on Thursday, April 3.

As a show it was good, but the chief attraction was the life and vigour with which they put it over, and never can any show have been more aptly named. The cast was very strong in talent considering that it was composed entirely of Apprentices. Among those who stood out particularly were L.A./A. Jones, he was a tower of strength to the whole cast, and his interpretation of his part was distinctly professional; A.A. Bishop as "Jimmie" was an admirable small boy at the age when boys are boys, and A.A. Watts as "Miss Dural Whitemetal" was ravishing.

"SILVER WINGS"

THERE has always been a number of people who say that when aircraft crashes cease to interest the daily press then people will travel by aircraft as naturally as they do by trains. As a measure of the popularity of aircraft surely the introduction of aircraft into musical comedy must take equal place. "Silver Wings," the show now running at the Dominion Theatre, makes use of aircraft in a very effective way, and though, to judge from the applause, it evidently falls short of expectations, no one can deny that it is worth seeing. The scenery is magnificent and the second and third acts are about the prettiest we have ever seen on the stage. The chorus is perfectly trained, and even the most hardened musical comedy critic would have been hard put to it to pick holes in their part of the show.

The theme hangs on a trip from England to Mexico in a Moth, which is made non-stop, with wireless transmitting gear and a stowaway on board! This needs no comment from those who can distinguish between the S.6 and an Argosy, but seeing that it is in a musical comedy, presumably one has to make full allowance for this "flight of fancy"; Inez would hardly have felt at home had her "Heaven sent" had to come to her in County Galway!

We have lately heard a great deal about the way aeroplane crashes are arranged for the films, and undoubtedly when a

Mr. A. C. Kermode, who wrote, arranged and produced the play, showed great versatility, and among the songs which ought to be perpetuated were: "In a Military Way," "Home-sickness," "The Trial Flight," and "March of the Airmen."

The orchestra of 25 members is astonishingly good, and is composed, as is the dance band of each Wing, entirely of Apprentices. In connection with the orchestra Mr. R. H. Cort deserves the greatest congratulation, for not only does he run it in his spare time—he is in business in Wendover and has no connection with the Camp—but he also composed, arranged and orchestrated the music for the whole show.

The committee, with Mr. G. W. Whittaker as Hon. Secretary, must have worked immensely hard to get out the production in three months, and we offer the heartiest congratulations to all concerned.

real aeroplane can be really crashed to order, in front of the camera, very fine effects can be secured, but Mr. Joseph Cunningham provides us with something very nearly as realistic in the crash he has arranged at the end of the first act, and for those who are interested in the application of aircraft to the stage, "Silver Wings" is a revelation. At the end of the first scene of the first act, when the machine is supposed to start off on its eventful flight, the engine is started up. In order to do this the Brooklands School of Flying, who supplied the Moth, built a form of wick carburettor with a container for the fuel. The whole of the fuel content has to be absorbed in cotton wool, and to further comply with the L.C.C. regulations, the carburettor has to be detachable. It speaks well for the Brooklands people and for the Cirrus engine that since the show has been running the engine has only twice failed to start at the critical moment. Ordinary petrol is used, and no other preparations are found to be necessary.

On the whole the show is well worth seeing, though it must be admitted that from the musical point of view it does not seem to be holding its own very well. Why this should be it is a little hard to understand, as there are many excellent musical numbers in it, and with the added advantage of the comfort of the new theatre it should run for a long time.

THE ROYAL AIR FORCE

London Gazette, April 1, 1930

General Duties Branch

The follg. Pilot Officers on probation are confirmed in rank:—G. S. King (Feb. 11); E. D. Bishop, A. F. C. Booth, R. C. A. Brooke-Beer, E. A. Cooke, C. S. Gill, F. R. W. Goad, L. E. Jarman, V. R. Moon, G. E. Mustard, G. N. Roberts, H. L. Smith, D. W. Smythe, T. H. Wilson (Feb. 22); G. F. Alexander, S. J. H. Carr, R. P. Cauthery, R. H. Cave Penney, H. M. B. Collins, C. E. Hartley, P. B. Lusk, C. S. Millar, H. B. Robertson (April 2).

The follg. Pilot Officers are promoted to rank of Flying Officer:—D. J. Hughes-Morgan (July 9, 1929); A. G. Adnams, B. A. Blythe, A. E. Louks (March 14).

Flying Officer F. W. Wrench takes rank and precedence as if his appointment as Flying Officer bore date Oct. 25, 1921. Reduction takes effect from March 8, 1930; Group Capt. E. M. Murray, D.S.O., M.C., is placed on half-pay list, scale A. March 1 to 28 inclusive. The follg. are placed on retired list at their own request:—Wing Commander J. N. Fletcher, A.F.C. (March 31); Flying Officer F. T. Jacobs (April 1).

The follg. are transferred to Reserve, Class A:—*Flight Lt.*—H. J. Gearing (April 1). *Flying Officers*—M. Brunton, F. W. Field, F. H. Hannaford, G. J. C. Mahony, V. C. Taylor (March 31); P. G. Tweedie (April 1).

Capt. B. W. Knowles, R.M., Flying Officer, R.A.F., relinquishes his temp. commn. on return to duty with Royal Marines (Feb. 10); Capt. H. M. A. Day, A.M., R.M., Flight Lt., R.A.F., relinquishes his temp. commn. on return to duty with Royal Marines (March 31); Lt. R. H. Langton, R.N., Flying Officer, R.A.F., relinquishes his temp. commn. on retirement from Royal Navy (March 18).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain H. L. Reilly, D.S.O., to R.A.F. Depot, Uxbridge; attending Senior Officers' War Course at the R.N. War College, Greenwich, 17.3.30.

Wing Commanders: J. S. T. Bradley, O.B.E., to Station H.Q., Northolt, to command, 17.3.30. O. H. Elliott-Smith, A.F.C., to Armoured Car Wing, Iraq, to command, 22.2.30.

Squadron Leaders: D. E. Stodart, D.S.O., D.F.C., to H.Q., Iraq Command, 26.2.30. B. McEntegart, to Central Flying Sch., Wittering, 24.3.30.

Flight Lieutenants: C. W. Busk, M.C., A.F.C., to Practice Camp, Sutton Bridge, 8.3.30. G. H. Vasse, to Practice Camp, North Coates Fitties, 8.3.30. W. Wynter-Morgan, M.C., to Practice Camp, Catfoss, 8.3.30. J. R. D. Goadsby, to Station H.Q., Tangmere, 17.3.30. M. C. W. C. Flint, M.C., to No. 70 Sqn., Iraq, 24.2.30. G. D. Middleton, to R.A.F. Base, Malta, 5.3.30. C. H. A. Stevens, to Air Ministry (D.O.S.D.), 7.3.30.

Flying Officers: P. J. H. Halahan, to No. 35 Sqn., Bircham Newton, 11.3.30. H. V. Crowder, to R.A.F. Depot, Uxbridge, 8.3.30. G. I. L. Saye, to No. 209 Sqn., Mount Batten, 17.3.30. M. G. R. Harris, to No. 58 Sqn., Worthy Down, 17.3.30. F. P. Donovan, to No. 1 Flying Training Sch., Netheravon, 17.3.30. D. M. Rees, M.B.E., to Practice Camp, North Coates Fitties, 12.3.30. N. S. Allinson, to Practice Camp, North Coates Fitties, 8.3.30. D. J. R. Hylton, to Practice Camp, Catfoss, 8.3.30. D. M. Harrison, to Practice Camp, Catfoss, 22.2.30. C. H. R. Little, Practice Camp, Sutton Bridge, 8.3.30.

Stores Branch

Wing Commander E. J. Sayer, M.C., is placed on retired list (March 27); Flight Lt. J. G. Smithson is placed on retired list at his own request (March 31).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The follg. are granted commns. in Class A.A. (ii) as Pilot Officers on probation:—A. C. C. Seligman, A. J. C. Stuart (March 17); C. E. G. Mumby (March 18); O. P. E. Reed, P. R. Q. Henriques (March 19); J. O. Hinks, A. J. Fedden (March 20). G. J. W. Oddie is granted a commn. in Class B.B. as Pilot Officer on probation (April 1); A. M. Carey is granted commn. in Special Reserve as Pilot Officer on probation (March 8); Flying Officer on probation C. R. Robbins, M.C., D.F.C., is confirmed in rank (March 20); Flying Officer E. G. D. Stewart, M.C., is transferred from Class A to Class C. (March 5); Flying Officer E. D. Cummings, D.F.C., is transferred from Class C to Class A (March 19).

Gazette Nov. 26, 1929, concerning Flying Officer C. McL. Reid is cancelled.

AUXILIARY AIR FORCE

General Duties Branch

No. 600 (CITY OF LONDON) (BOMBER) SQUADRON.—The follg. to be Pilot Officer:—G. E. Villiers (March 17). No. 605 (COUNTY OF WARWICK) (BOMBER) SQUADRON.—The follg. to be Pilot Officer:—E. S. Lambert (Jan. 13). Flying Officer J. A. Edwards resigns his commn. (March 3).

Pilot Officers: O. M. Rees, B. J. Hurren and C. R. Lousada, to No. 2 Sqn., Manston, 4.3.30. D. H. F. Barnett, H. B. Collins and G. B. Keily, to No. 13 Sqn., Netheravon, 4.3.30. H. L. Messiter and H. A. Shotton, to No. 16 Sqn., Old Sarum, 4.3.30. R. C. Dawkins, C. V. Ogden and J. S. D. Miles, to No. 26 Sqn., Catterick, 4.3.30. G. J. Pawson, to No. 17 Sqn., Upavon, 4.3.30. A. J. Tunnard, to No. 23 Sqn., Kenley, 4.3.30. F. Lemon and E. A. H. Tanner, to No. 29 Sqn., North Weald, 4.3.30. G. C. Holland, V. C. F. Streetfield and J. D. Baker-Carr, to No. 32 Sqn., Kenley, 4.3.30. R. F. Fletcher, to No. 43 Sqn., Tangmere, 4.3.30. D. R. C. B. de Sarigny, to No. 54 Sqn., North Weald, 4.3.30. M. P. O'Reilly, to No. 111 Sqn., Hornchurch, 4.3.30.

Stores Branch

Flight Lieutenant C. J. Polden, to No. 21 Group H.Q., West Drayton, 1.4.30.

Medical Branch

Squadron Leaders: D. G. Boddie, to Air Ministry (D.M.S.), 19.3.30. W. E. Hodgins, to H.Q., Coastal Area, 19.3.30.

Flying Officer W. J. Cotter, to Station H.Q., Worthy Down, 12.3.30.

NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty:—Lieut.-Commr. (Flight-Lieut. R.A.F.) A. G. Elliot, to *Victory*, April 11. Lieut. G. R. F. T. Cooper (F/O, R.A.F.) to *Barham*.

IN PARLIAMENT

Civil Aviation Subsidies

MR. MONTAGUE, on April 1, in reply to Mr. Longden, said the cost of civil aviation subsidies in respect of air transport services in the year just ended was £341,500.

R.A.F. in Egypt and Iraq

MR. MONTAGUE, in reply to Sir A. Knox, said the annual cost of squadrons in Egypt and Iraq varies considerably with their location, the type of aircraft with which they are equipped and the character and extent of the duties on which they are employed. Any very precise figure is impossible, but as a rough estimate based on the maintenance cost of squadrons equipped with a standard type of single-engine bombing aircraft, the annual cost might be said as about £120,000 in Iraq and £110,000 in Egypt.

London Naval Conference

MAJOR ROSS on April 2 asked the First Lord of the Admiralty whether, in addition to the limitation of tonnage in aircraft carriers by the Naval Conference, any limitation of naval aircraft is contemplated; and whether the number of naval aircraft possessed by the Powers concerned will be taken into consideration in settling their relative strengths?

MR. G. HALL: Limitation of tonnage in aircraft carriers automatically limits the number of carrier-borne aircraft that can be employed. No limitation of shore-based aircraft is contemplated at the present Conference, but

the number of naval aircraft possessed by the Powers concerned is borne in mind by the Admiralty.

World Speed Record

MR. MONTAGUE, in reply to Mr. Mander, said that no further attempts on the world speed record are at present contemplated with the Supermarine S6 or Gloster-Napier seaplanes. The high speed aircraft are being used for research purposes.

Schneider Trophy

CAPTAIN HAROLD BALFOUR (for Sir Samuel Hoare) asked the Under-Secretary of State for Air whether his decision as to the loan of high-speed aircraft for the Schneider trophy applies to the machines already in existence and used on the occasion of the last contest in September, 1929, or whether it means merely that the Air Ministry is not prepared to pay for the construction of further high-speed aircraft with a view to their subsequent loan?

MR. MONTAGUE: My statement on Air Estimates was intended to apply to the proposal that the Air Ministry should undertake the construction and loan of new machines, expenditure on which is not considered justifiable in present circumstances. When the current programme of experimental high-speed flying is completed, however, the Air Ministry will be prepared to consider sympathetically any proposals which may be put forward for lending the machines which are already in existence, provided the cost of any necessary modifications to them is borne by private enterprise, in accordance with the declared policy of His Majesty's Government.

PERSONALS

Married

FLIGHT-LIEUTENANT GERALD PAUL HALLILEY CARTER, R.A.F., son of Mr. and Mrs. W. F. Carter, was married on March 20, at St. George's Church, Moascar, Egypt, to ESTHER MARY DOUGLAS, daughter of the late Major-General SIR H. J. M. MACANDREW, K.C.B., D.S.O., and of the late Mrs. MacAndrew.

To be Married

The engagement is announced between Flight-Lieutenant GERARD COMBE, R.A.F., third son of Mr. and Mrs. Percy Combe, and BRENDA MARY (BENNIE), elder daughter of Mr. and Mrs. HUGH BAINBRIDGE, of Killeen, Lakeside-Road, Bournemouth, West.

The engagement is announced between Flight-Lieutenant JAMES DONALD INNES-HARDMAN, elder surviving son of the late JAMES HARDMAN, M.A., of Delph, Yorkshire, and Mrs. Hardman, of Oxford and DOROTHY URSULA, elder daughter of Mr. and Mrs. ASHCROFT THOMPSON, of Larkenshaw, Chobham.

The engagement is announced between JOHN VINCENT KELLY, only son of Major and the late Mrs. V. J. Kelly, of Dublin, Ireland, and BERYL FRANCIS, younger daughter of Mr. and Mrs. F. N. GARNETT, of The Pryors, Hampstead.

A marriage has been arranged, and will shortly take place, between CAPTAIN W. F. FLETCHER (late R.A.F.) and DORIS BUTLER, M.B., Ch.B., daughter of Mr. J. G. Butler and the late Mrs. Butler, of Ecclesall, Sheffield.

The engagement is announced between Mr. WALTER HUGH MERTON, R.A.F., elder son of Mr. and Mrs. Gerald Merton, and BATHSHUA HELEN BECKFORD KIRBY, only child of the late Henry John Alexander Kirby and Mrs. Kirby, of 46, Christ Church Road, Winchester, and grand-daughter of the late Francis John Bramston Beckford, of Witley, Parkstone, Dorset.

The marriage arranged between REGINALD H. SCHLOTEL, a Director of the Airship Development Co., Ltd., younger son of Mr. and Mrs. Herbert C. Schlotel, of Surbiton, and Miss PHYLLIS M. DONNE, elder daughter of Mr. and Mrs. F. W. Donne, of Eastbourne, will take place on Saturday, April 26.

The engagement is announced between Flight-Lieutenant FRANK LESLIE WHITE, R.A.F., M.S., elder son of Dr. and Mrs. F. H. White, London, and HELEN REOCH, only daughter of Mr. and Mrs. D. H. W. Ritchie, Dura, Cupar, Fife.

MODELS

GAMAGE CUP COMPETITION

POSTPONED from last week, the competition for the Gamage Cup was held on Wimbledon Common on Saturday, April 5. The weather was calm, but somewhat damp.

The winning models in the Gamage Cup were all twin screw pushers and undoubtedly the calm weather favoured them. The fuselage machines were, however, giving a good account of themselves and although the durations of these machines was not so great they climbed with much greater ease than the twin pushers and looked much more graceful in the air.

After the competitions Mr. Pavely managed to get his Gamage model going properly and made a flight of 121 secs.

Result.—1st, R. N. Bullock (S.M.A.E.), 105 sec.; 2nd, D. A. Pavely (T.M.A.C.), 97½ sec.; 3rd, F. Wilkinson (T.M.A.C.), 66 sec.

HARROGATE AIRCRAFT CLUB MODEL COMPETITION

THE competition organised by the Harrogate Aircraft Club (Model Section) was successfully flown on April 5, and below we give a few notes and the results.

The beautiful flying of Capt. Bowden's models was much admired. Mr. Gosling's large tractor monoplane had not been previously flown and was obviously capable of a much longer flight when properly adjusted. Mr. Ellis's Class I machine was only finished on the field and the same remarks apply. Mr. Gosling's Class III machine was about 10 years old and evidently had a remarkably fine performance, but unfortunately lodged in a high tree 200 yards away from the flying field, and could not be recovered until after the close of the competition so he missed his last attempt.

Mr. Ellis's Class III machine struck a hedge, it was only completed on the field and when properly tuned up appears to be capable of a very fine performance.

Class IV (Warneford Cup), event was not flown; the results were:—

Class I (R.O.G.).—1st, Capt. C. E. Bowden, "Falcon", Monoplane tractor, enc. fusel., 34½ sec.; 2nd, R. F. L. Gosling, Esq., own make, monoplane tractor, enc. fusel., 8 sec.; 3rd, C. H. Ellis, Esq., own make, monoplane tractor spar, 7 sec. (1st prize—Medal; 2nd prize, DAP propeller).

Class II (Boys' Hand-launched).—1st, D. Hawthornthwaite, own make, monoplane tractor spar, 8 sec.; 2nd, D. Boyd, "Warneford," monoplane tractor spar, 6½ sec.; 3rd, Hamilton, "Warneford," monoplane tractor spar, 2 sec. (1st prize—Medal; 2nd prize—DAP propeller).

Class III, Open Hand-launched.—1st, Capt. C. E. Bowden, "Falcon," mono. tractor, enc. fuselage, 35½ sec.; 2nd, R. F. L. Gosling, Esq., own make, twin pusher monoplane, 29 sec.; 3rd, Capt. C. E. Bowden, "Pixie," mono tractor, enc. fuselage, 28½ sec.; 4th, C. H. Ellis, Esq., own make, twin pusher monoplane, 21½ sec. (1st prize—Cup; 2nd prize—Medal; 3rd prize—DAP propeller).

THE MODEL AIRCRAFT CLUB (T.M.A.C.)

A most successful and enjoyable meeting was held by the Model Aircraft Club on Wimbledon Common on Saturday, April 5. The Gamage Cup was competed for and the Club's competition took place.

Although the weather was dry, the damp atmosphere was not altogether conducive to a high standard of efficiency, but even so, most members put up a wonderfully good performance. The results were:—

Fuselage Competition.—1st, Mr. A. T. Willis, 45 sec.; 2nd, Mr. J. Welding, 41 sec.; 3rd, Mr. Englefield, 33½ sec.

Spar Competition.—1st, Mr. Pavely, 97½ sec.; 2nd, Mr. Wilkinson, 66 sec.; 3rd, Mr. Holt, 49.2 sec.

Ladies' and Junior Competition.—1st, Mrs. Willis, 45 sec.; 2nd, Master Willis, 35½ sec.; 3rd, Master Walker, 18.2 sec.

Mrs. Ralph White kindly presented the prizes on the field, and the winners were delighted with the lovely little clocks and cameras which they won.

A large crowd of enthusiastic spectators assembled, and it was not until it was quite dark that the meeting ended.

On Saturday next, April 12, an Aerial Golf Competition will be held on Wimbledon Common for the K.M.A.A. Cup. Will all members try and compete? Hon. secretary, A. E. Jones, 48, Narcissus Road, West Hampstead, N.W.6.

PUBLICATIONS RECEIVED

A Narrative History of Aviation. By John Goldstrom. The Macmillan Co., New York. London: Macmillan and Co., Ltd., St. Martin's Street, W.C.2. Price 17s. net.

The Gauge. Vol. 8, No. 7. March, 1930. J. J. Habershon and Sons, Ltd., Holmes Mills, Rotherham.

The World's Aeroplanes and Airships. By G. Gibbard Jackson. Sampson Low, Marston Co., Ltd., 100, Southwark Street, London, S.E. Price 6s. net.

U.S. National Advisory Committee for Aeronautics. Reports: No. 330.—Experimental and Analytical Determination of the Motion of Hydraulically Operated Valve Stems in Oil-Engine Injection Systems. By A. G. Gelalles and A. M. Rothrock. Price 10 cents. No. 332.—The Effect of Cowling on Cylinder Temperatures and Performance of a Wright J-5 Engine. By O. S. Schey and A. E. Biermann. Price 15 cents. No. 333.—Full-scale Turning Characteristics of the U.S.S. Los Angeles. By F. L. Thompson. Price 10 cents. No. 335.—Aerodynamic Theory and Test of Strut Forms—II. By R. H. Smith. Price 20 cents. No. 337.—The Gaseous Explosive Reaction at Constant Pressure: The Reaction Order and Reaction Rate. By F. W. Stevens. Price 10 cents. Superintendent of Documents, Washington, D.C., U.S.A.

Technical Notes of the U.S. National Advisory Committee for Aeronautics: No. 330.—Wind Tunnel Pressure Distribution Tests on a Series of Biplane Wing Models: Part III. Effects of Changes in Various Combinations of Stagger, Gap, Sweepback, and Decalage. By M. Knight and R. W. Noyes. Dec., 1929. No. 331.—Rate of Heat Transfer from Finned Metal Surfaces. By C. F. Taylor and A. Rehbock. Jan., 1930. No. 332.—Injection Lags in a Common-Rail Fuel-Injection System. By A. M. Rothrock. Feb., 1930. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

The Planesman. March, 1930. Vol. VIII, No. 87.—Wm. Corn, Ground Training Section, A. & G. School, R.A.F., Eastchurch, Kent. Price 6d.

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22,261. H. JUNKERS. Fuel-pumps for i.c. engines. (317,319.)
22,263. H. JUNKERS. Centrifugal governors. (317,321.)
32,493. A. E. and H. O. SHORT. Amphibian aircraft. (326,757.)

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